

**SONY**

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PORTABLE VIDEOCASSETTE RECORDER

# **PVV-1P/1AP**

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## **SERVICE MANUAL**

Vol.1 1st Edition Revised 1  
Serial No.10001 and Higher

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**BETACAM SP**  
**2000PRO**

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## INTRODUCTION

This service manual is described for PVV-1P and PVV-1AP models.

The exclusive informations for PVV-1P or PVV-1AP are mentioned in that necessary sections.

**Note:**

PVV-1P and PVV-1AP models differ the following board names.

PVV-1P		PVV-1AP
VO-34P Board	←→	VO-34AP Board
TC-60P Board	←→	TC-60AP Board





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**Volume.2**

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# SECTION 1

## SERVICE INFORMATION

### 1-1. SPECIFICATIONS

#### General

Power requirements	DC 12 $\pm$ 5 V -1 V
Power supply usable	NP-1B Battery Pack BP-90A Battery Pack (To use as internal battery, DC-500 Battery Adaptor is required.) AC power (requires AC-500/500CE AC adaptor)
Power consumption	10 W
Operating temperature	0°C to + 40°C (32°F to 104°F)
Operating humidity	25% to 85% or less (no condensation)
Weight	Main unit: 3.4 kg (7 lb 8 oz) Battery pack: NP-1B: 0.7 kg (1 lb 9 oz) BP-90A: 1.6 kg (3 lb 8 oz)
Dimensions (w/h/d, excluding projections)	127 × 194 × 200 mm (5 × 7 $\frac{3}{4}$ × 7 $\frac{7}{8}$ inches)
Recommended cassettes	1/2 inch Betacam SP metal cassettes: BCT-5M/10M/20M/30M or equivalent
Normal tape speed	101.5 mm/sec
Record/playback time	Max. 35 minutes (with BCT-30M)
Fast Forward time	4.5 minutes or less (with BCT-30M)
Rewind time	4.0 minutes or less (with BCT-30M)
Continuous operating time	About 70 minutes (with DCX-537P camera and NP-1B Battery Pack)

#### Video system

Video recording system	Luminance: FM Chrominance: FM (Compressed Time Division Multiplex)
------------------------	--

Band width	Luminance (50% modulation)		25 Hz to 5.5 MHz +0.5 dB -4.0 dB
	Color difference (50% modulation)		25 Hz to 2.0 MHz +0.5 dB -3.0 dB
S/N	Luminance (Component)		48 dB or greater
	Color difference	R-Y	48 dB or greater
		B-Y	48 dB or greater
K factor (2T pulse)			2% or less
Y/C delay			20 nsec or less

#### Audio system

Audio recording system Stationary heads

Frequency response	50 Hz through 15 kHz +1.5 dB -3.0 dB
S/N	62 dB or greater (at peak level*, weight CCIR-468-3)
Distortion	1.5% or less (at 1 kHz reference level)
Wow & Flutter	0.15% or less

\*peak level : +8 dB above operational level

#### Input Connectors

Video input (50 pin interface for camera connection)	Luminance: 1.0 V p-p, 1 k $\Omega$ Color difference: B-Y, R-Y: 0.7 V p-p, 1 k $\Omega$
AUDIO IN CH-1/CH-2 (XLR, 3P)	-60 dB/+4 dB
GEN LOCK VIDEO IN (BNC)	1.0 V p-p, 75 $\Omega$
TC IN (BNC)	0.5 to 5 V p-p, 10 k $\Omega$

#### Output Connectors

ENCODE VIDEO OUT (BNC)	1.0 V p-p, 75 $\Omega$
TC OUT (BNC)	1.0 V p-p, 75 $\Omega$
EARPHONE (minijack)	8 $\Omega$ , variable - $\infty$ to -20 dB
PB ADAPTOR (20pin)	For PVV-1AP

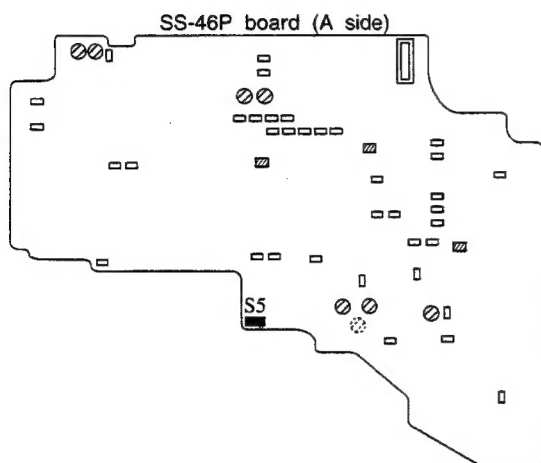


## 1-2. SETTING OF THE SYSTEM SWITCH

### 1. SS-46P Board

Ref. No.	Name	Shipped position
S5	SLACK MUTE SW	OFF

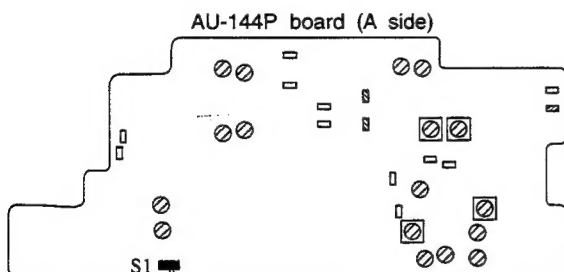
When turned ON, detection of the slack is muted.  
Normally set to the OFF position.



### 2. AU-144P Board

Ref. No.	Name	Shipped position
S1	DOLBY ON/OFF SW	ON

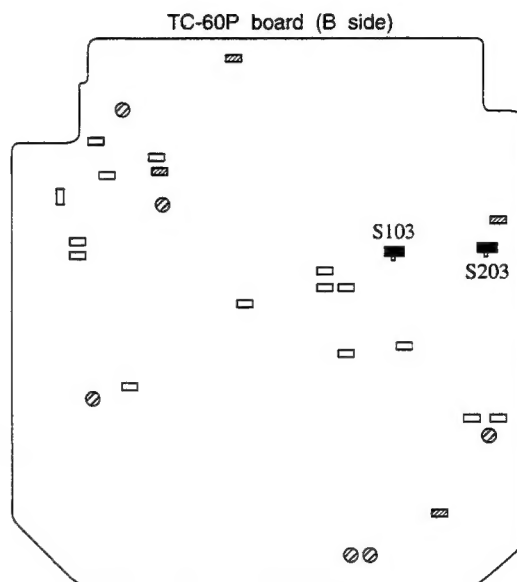
When turned OFF, dolby recording is released.




### 3. TC-60P Board

Ref. No.	Name	Shipped position
S103	CH-1 LIMITER SW	ON
S203	CH-2 LIMITER SW	ON

When turned OFF, audio level limiter is released.



"DOLBY Y" and the double-D symbol  are trademarks of Dolby Laboratories Licensing Corporation.

### 1-3. INPUT/OUTPUT SIGNAL OF CONNECTORS

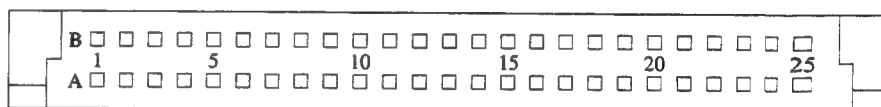
#### 1-3-1. Input Connectors

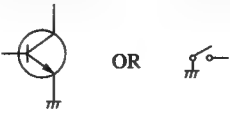
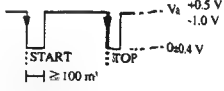
AUDIO IN (XLR, 3P): MIC: -60 dBu, 3 k $\Omega$ ,  
balanced  
LINE: +4 dBu, 10 k $\Omega$ ,  
balanced  
(0 dBu=0.775 Vrms)  
balanced  
GEN LOCK VIDEO IN (BNC): 1.0 V p-p, 75  $\Omega$   
TC IN (BNC): 0.5 through 5 V p-p, 10 k $\Omega$   
DC IN (XLR 4P): 4 pin DC IN 12  $\frac{+5}{-1}$  V  
1 pin GND

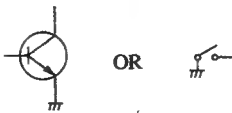
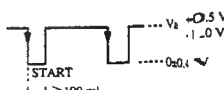
#### 1-3-2. Output Connectors

ENCODE VIDEO OUT (BNC): 1.0 V p-p, 75  $\Omega$   
TC OUT (BNC): 1.0 V p-p, 75  $\Omega$

#### 1-3-3. 50 PIN CONNECTOR

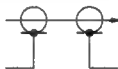
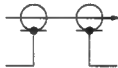
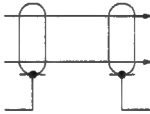
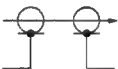


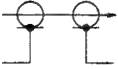




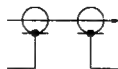


PIN NO.	Input/output signal	Specifications			Note
		Camera	Direction	VTR	
A1	MODE ID	MODE ID 100 k $\Omega$ $\pm$ 10% 5.0 V dc $\pm$ 10%, PULL UP	←	MODE ID OPEN: Y/R-Y/B-Y mode GND: R/G/B mode	
B1	CHASSIS GND		↔		
A2	MIC1(Y)	-60 dBm	→	Zi $\geq$ 3 k $\Omega$	
B2	MIC1(X)				
A3	MIC1(G)				
B3	EAR PHONE(GND)	Zi=750 $\Omega$ $\pm$ 10%	←	Zo $\leq$ 100 $\Omega$ , -6 dBu	0 dBu=0.775 Vrms
B4	EAR PHONE(X)				
A4	REC/TALLY INDICATION	Zi $\geq$ 600 $\Omega$	←	ON: 4.0~5.5 V dc OFF: 0 $\pm$ 0.2 V dc	
B5	REC STATUS (REC RESET)	Zi $\leq$ 10 k $\Omega$ 5.0 V dc $\pm$ 10%, PULL UP REC: H	←	Open collector	
A5	VTR TRIGGER (L: VTR START/STOP)	ON → OFF    OPEN → CLOSE START/STOP    START/STOP Vceo $\geq$ 12 V    chattering $\leq$ 50 ms 	→	Zi $\geq$ 10 k $\Omega$ Pull Up Va $\leq$ 10 V	
A6	SPARE				Non Connection
B6	SPARE				
A7	SPARE				
B7	SPARE				
A8	GEN LOCK VIDEO(G)	Zi $\geq$ 1 k $\Omega$ $\pm$ 5%	←	Zo $\geq$ 75 $\Omega$ $\pm$ 10% W/camera	

PIN NO.	Input/output signal	Specifications			Note
		Camera	Direction	VTR	
B8	GEN LOCK VIDEO(X)			V dc=0±0.2 V dc VBS: 1.0 V p-p sync: negative	
A9	SYNC, CF(G)		↔		
B9	COMP.SYNC(X)	H: 4.0~5.5 V p-p; negative, L: 0±0.4 V dc Zo≤2 kΩ	→	Zi≥10 kΩ	
A10	PLAYBACK VIDEO(G)	Zi≥1 kΩ ±5%	←	1.0 V p-p sync: negative Zo≤75 Ω ±5%, V dc=0±0.2 V dc	
B10	PLAYBACK VIDEO(X)				
A11	COLOR FRAMING PULSE(X)	H: 4.0~5.5 V p-p; negative, L: 0±0.4 V dc Zo≤2 kΩ	→	Zi≥10 kΩ	
B11	PLAYBACK STATUS (VF H: CAM/L: PB)	Zi≥1 kΩ 4.5~9.5 V dc, PULL UP	←	CAM mode: OPEN PB mode: 0±0.4 V dc	
A12	VBS(G)	1.0 V p-p±10%, Zo=75 Ω ±5%,	→	Zi=75 Ω ±5%	
B12	VBS(X)	V dc=0±0.2 V STANDBY: 4.0~5.5 V dc SAVE: 0±0.25 V dc Zo≤100 Ω	→	Zi≥1 kΩ	
A13	VTR SAVE				
B13	VTR/CCU CONT	VTR: 0±0.25 V dc, CCU: 5.0±0.5 V dc, Zo≤1 kΩ	→	Zi≥4.7 kΩ	VTR: Open
A14	NC				
B14	NC				
A15	NC				
B15	NC				
A16	Y/R-Y/B-Y(G)		→		
B16	R-Y(X)	0.756 V p-p, setup 0% Zo=50~75 Ω	→	Zi=1 kΩ ±2%	
A17	Y(X)	0.714 V p-p, sync 0.286 V p-p, setup 0% Zo=50~75 Ω	→	ON: 2.0~3.0 V dc (470 Ω) OFF: 0±0.4 V dc	
B17	B-Y(X)	0.756 V p-p, setup 0% Zo=50~75 Ω	→		
A18	BATT ALARM (BATT IND)	Zo=470~10 kΩ	←		
B18	REC REVIEW (L: RETURN CONTROL)	ON → OFF    OPEN → CLOSE START/STOP    START/STOP Vceo ≥ 12 V    chattering ≤ 50 ms 	→	Zi≥10 kΩ Pull Up Va≤10 V	
A19	SERIAL DATA(X) (CAMERA SO)		↔		
B19	SERIAL DATA(G)				

PIN NO.	Input/output signal	Specifications			Note
		Camera	Direction	VTR	
A20	NC				
B20	NC				
A21	NC				
B21	GND				
A22	POWER +12 V DC		←	Min.: 10.6 V dc at 2A Max.: 17.0 V dc	
B22	POWER +12 V DC				
A23	POWER GND		←		
B23	POWER GND				
A24	SPARE				
B24	SPARE				
A25	CHASSIS GND		↔		
B25	CHASSIS GND				

#### 1-3-4. PB ADAPTOR CONNECTOR 20P (For PVV-1AP)

NO.	SIGNAL	VTR	DIRECTION	PB ADAPTOR
1	Y-RF(X)	75 $\Omega$ (OXIDE=0.1 V p-p) METAL=0.2 V p-p (Center Carrier)		Z=75 $\Omega$
2	Y-RF(G)			
20	C-RF(X)	75 $\Omega$ (OXIDE=0.1 V p-p) METAL=0.2 V p-p (Center Carrier)		Z=75 $\Omega$
19	C-RF(G)			
3	AUDIO CH1(X)	LOW Impedance -10 dBu		Z=10 k $\Omega$
5	AUDIO CH2(X)			
4	AUDIO(G)			
16	Y SW PULSE(X)	1, 3 CH: H 2, 4 CH: L OPEN COLLECTOR		Z=10 k $\Omega$ , Pull up +5 V
18	ADVANCE SYNC(X)			
15	ADVANCE SYNC(G)			
6	CONTROL SIG. 1	METAL "H" FF/REW "M" H=5.0 V M=2.5 V		HIGH Impedance
17	CONTROL SIG. 2	PLAY: HIGH (>6.5 V) Z=10 k $\Omega$		Z=57 k $\Omega$
9	VIDEO(X)			Z=75 $\Omega$ 1 V p-p
10	VIDEO(G)			
7	GND			
8	GND			
13	+12 V			
14	+12 V			
12	C SW PULSE (X)	1, 3 CH: L 2, 4 CH: H (0.3 V) EMITTER FOLLOWER (OPEN)		Z=75 $\Omega$
11	C SW PULSE (G)			

#### 1-4. CONNECTION CONNECTOR

When connecting the external cables to the connectors on the connector panel during maintenance, the connectors listed below (or the equivalents) must be used.

Panel indication	Connection connector
AUDIO IN	1-508-084-00 CONNECTOR, XLR, 3P, MALE
DC IN	1-508-362-00 PLUG, XLR, 4P, FEMALE
TC IN/OUT	1-560-069-11 PLUG, BNC, MALE
GEN LOCK VIDEO IN	1-560-069-11 PLUG, BNC, MALE
ENCODE VIDEO OUT	1-560-069-11 PLUG, BNC, MALE
CAMERA	1-566-579-11 CONNECTOR, 50P, MALE
PB ADAPTER (FOR PVV-1AP)	1-566-771-11 PLUG, 20P, MALE

#### 1-5. SUPPLIED ACCESSORIES

Supplied PVV-1P accessories are as follows:

1. Shoulder Strap (1) Part No. A-6722-374-B  
The shoulder strap can be attached to the PVV-1P. Both ends of the strap are attached to the knob on the unit easily.
2. +B 4×6 screw black (2) Part No. 7-682-560-09  
+B 4×12 screw black (2) Part No. 7-682-563-09  
Install two B4x12 screws on the camera's grip, and two B 4×6 screws on the camera's shoulder pad.

#### 1-6. RECOMMENDED ACCESSORIES

Use the following accessories according to the need.

1. Battery Pack: NP-1A/1B  
BP-90/90A  
NP-1A's capacity is 1.7 AH, and that of the NP-1B is 2.3 AH. BP-90's capacity is 3.5 AH, and that of the BP-90A is 5 AH. They are the chargeable 12 V battery pack.
2. Battery Charger: BC-1WACE/1WB  
BC-210CE/410CE
  - The BC-1WACE Battery Charger is designed to charge NP-1A battery packs. Four battery packs of NP-1A can be inserted at one time, and will be charged in sequence automatically.
  - The BC-1WB Battery Charger is designed to charge NP-1A/1B battery packs. Four battery packs of NP-1A/1B can be inserted at one time, and will be charged in sequence automatically.
  - The BC-210CE Battery Charger is designed to charge BP-90/90A battery packs. Four battery packs of BP-90/90A battery packs can be inserted at one time, and will be charged in sequence automatically.
  - The BC-410CE Battery Charger is designed to charge BP-90/90A, NP-1A/1B battery packs. Four battery packs of BP-90/90A and NP-1A/1B battery packs can be inserted at one time, and will be charged in sequence automatically.
3. AC Adaptor: AC-500CE, CMA-8ACE  
The PVV-1P can be driven by an AC power source from the AC adaptor, AC-500CE. The AC-500CE is worldwide type of adaptor. AC-500CE can be used with 100/120/220/240V commercial power supplies just by setting the voltage selector to the appropriate position for a stable supply of DC power.
4. Earphone: ME-20B  
The audio simultaneous playback sound (mixed sound of CH-1 and CH-2) in the REC mode can be monitored by connecting this ME-20B with PVV-1P. In other modes (except REC mode), the selected EE sound (selected by AUDIO IN and CH SELECT) can be monitored.
5. Battery Case: DC-500/520  
The battery case, DC-500 is for the battery pack BP-90. The battery case, DC-520 is for two battery packs of NP-1A/1B.
6. UHF Portable tuner: WRR-27/28/830
7. UHF Transmitter: WRT-27/28/810/820

#### 1-7. USE UNDER SPECIAL ENVIRONMENT (COLD AREA)

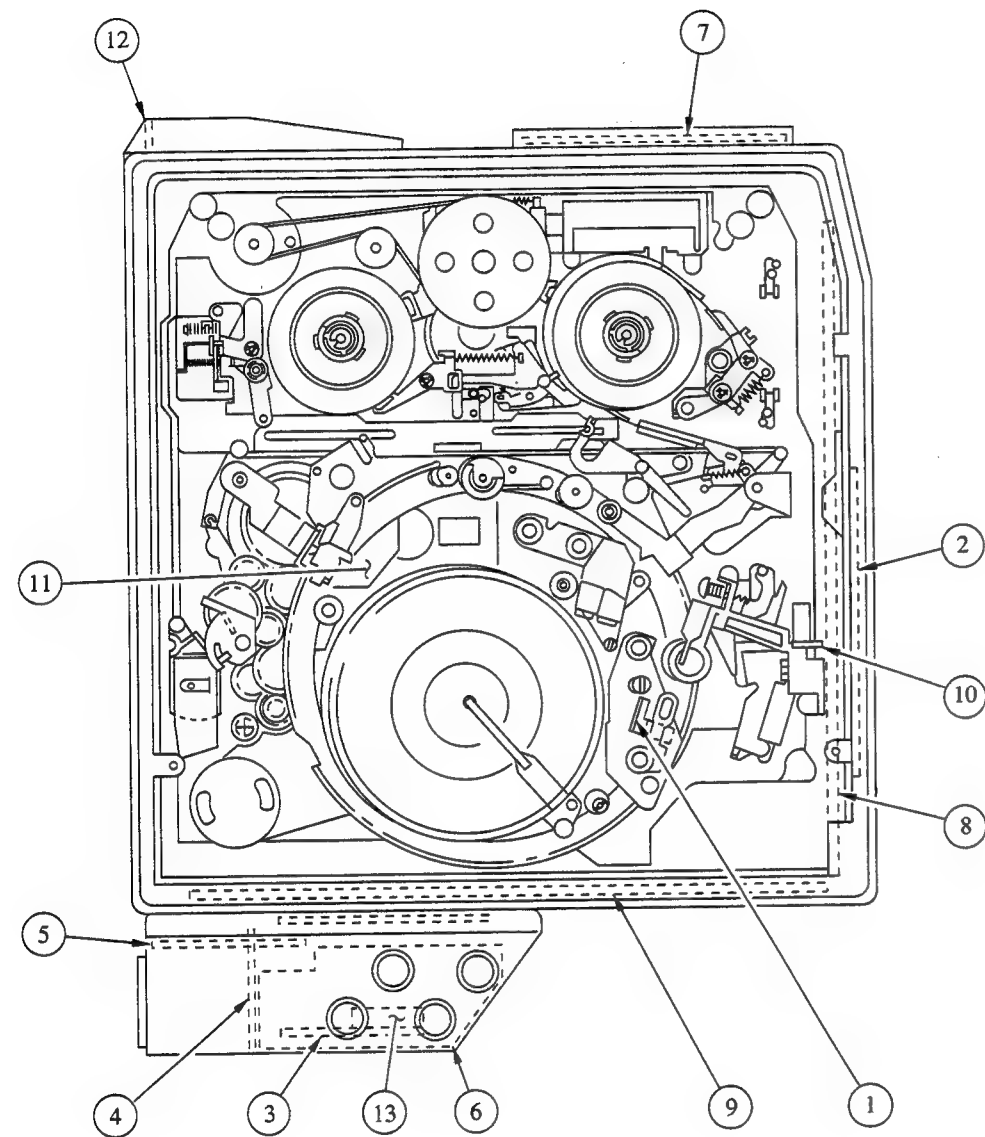
The guaranteed operation for PVV-1P is between the temperature of 0°C to 40°C.

When the unit is used out of the above temperature, especially in the cold area, over-cloth protection against the cold is recommended.



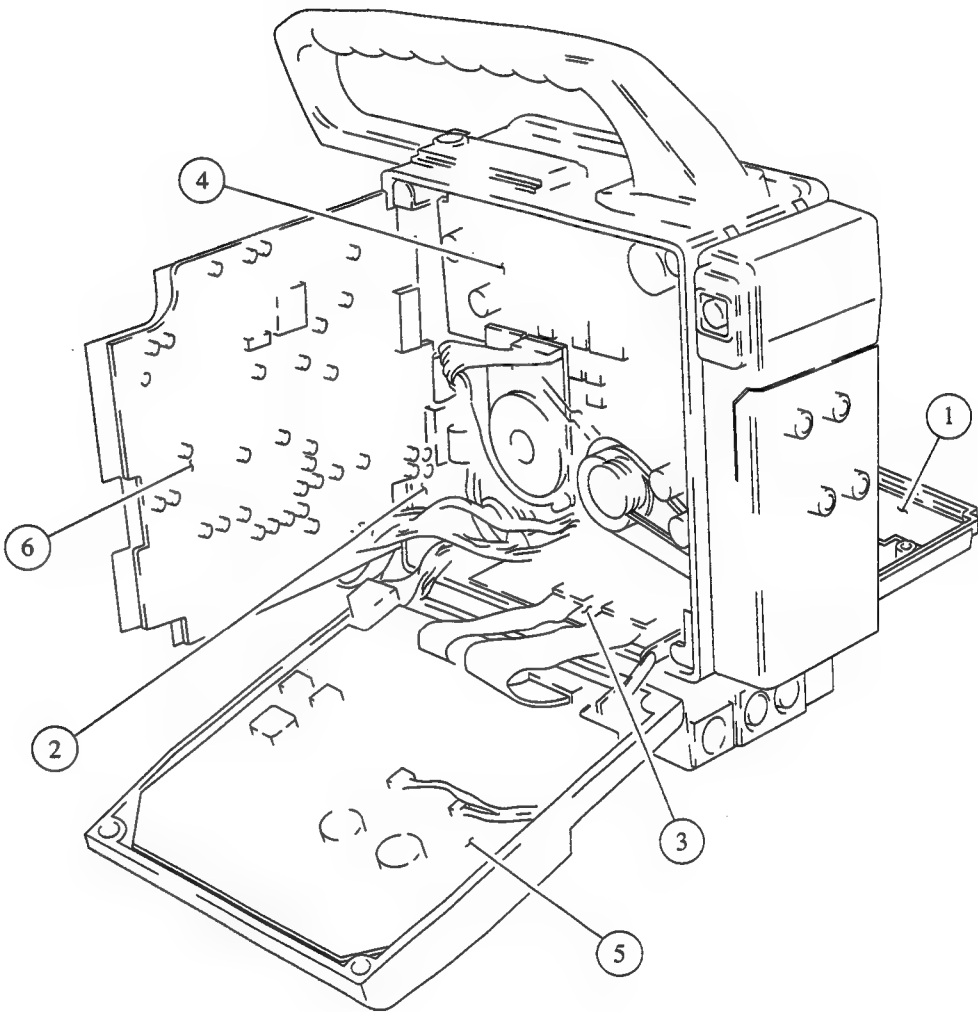
1-8. MAIN PARTS LOCATION

1-8-1. Location of the Boards (I)



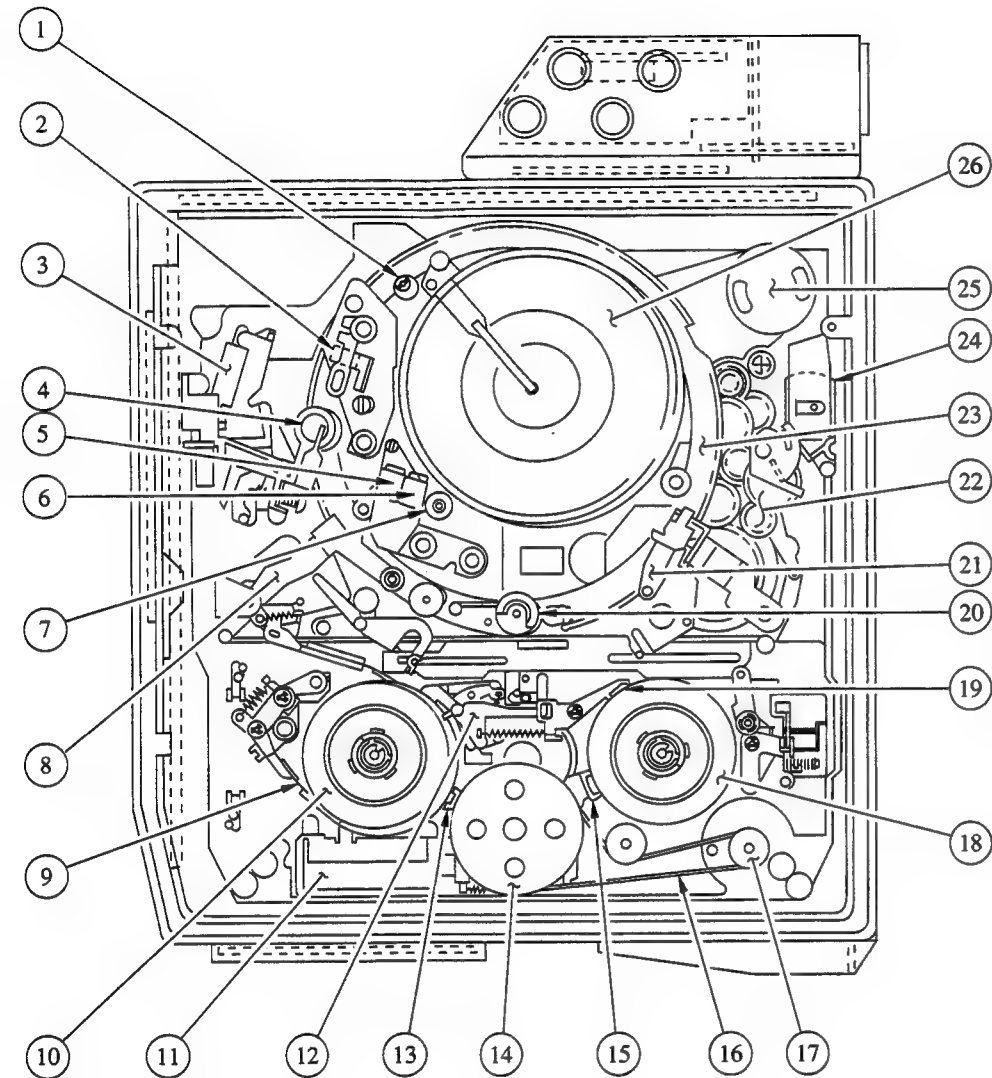
- ①AH-36 Board
- ②CN-504 Board
- ③CN-505 Board
- ④CN-560 Board
- ⑤HP-50 Board
- ⑥IO-61 Board
- ⑦KY-211 Board
- ⑧MB-362 Board
- ⑨MB-363 Board
- ⑩SE-60 Board
- ⑪SE-164 board
- ⑫SW-457 Board
- ⑬SW-474 Board

(II)



- ①AU-144P Board
- ②MB-362 Board
- ③MB-363 Board
- ④SS-46P Board
- ⑤TC-60P Board
- ⑥VO-34P Board

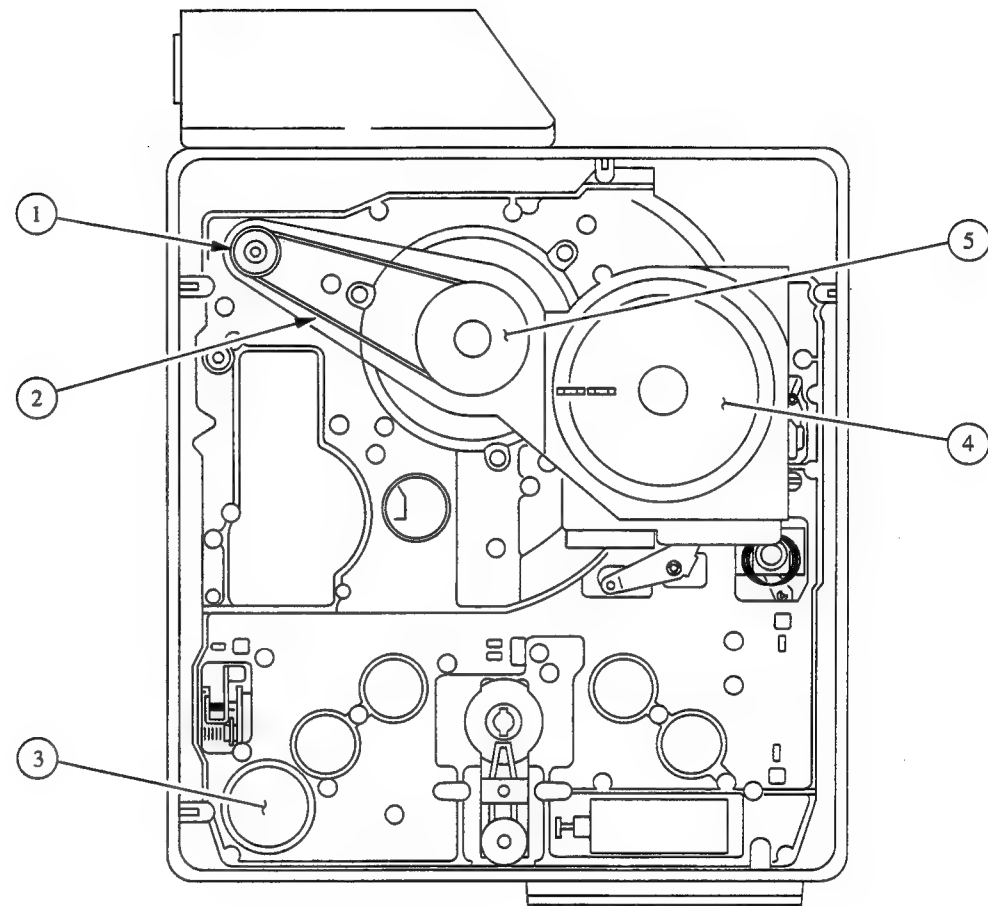
1-8-2. Location of the Main Mechanical Parts/Components ( I )



- ① Tape Guide (TG-II)
- ② Audio/TC Heads
- ③ Pinch Solenoid
- ④ Capstan Shaft
- ⑤ Full Erase Head
- ⑥ CTL Head
- ⑦ Tape Guide (TG-I)
- ⑧ Tension Regulator
- ⑨ Tension Regulator Band
- ⑩ Supply-side Reel Table
- ⑪ Brake Solenoid
- ⑫ Supply-side Soft Brake
- ⑬ Supply-side Main Brake

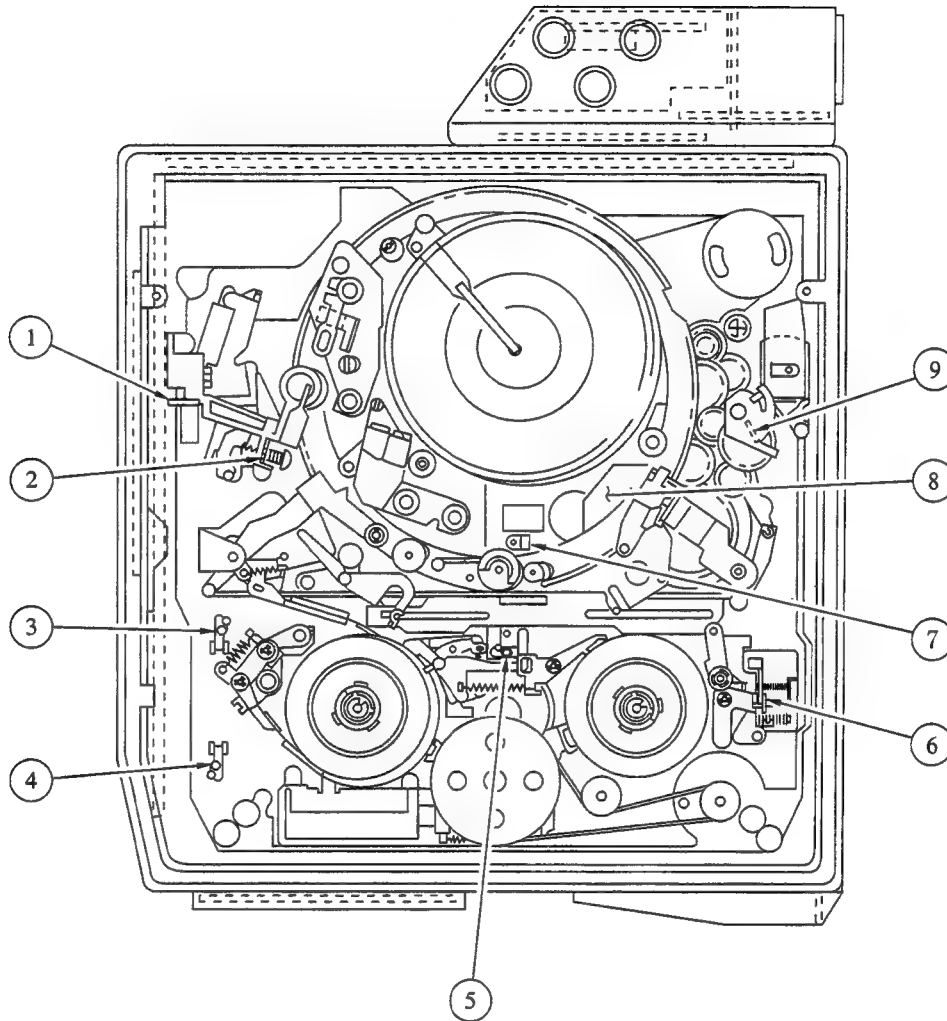
- ⑭ Intermediate Pulley
- ⑮ Take-up side Main Brake
- ⑯ Reel Belt
- ⑰ Reel Motor Pulley
- ⑱ Take-up side Reel Table
- ⑲ Take-up side Soft Brake
- ⑳ Pinch Roller
- ㉑ Slant Guide
- ㉒ Gear Block
- ㉓ Threading Ring
- ㉔ Threading Motor
- ㉕ Drum Motor
- ㉖ Head Drum

(II)



- ① Drum Motor Pulley
- ② Drum Belt
- ③ Reel Motor
- ④ Capstan Motor
- ⑤ Drum Pulley

### 1-8-3. Location of Micro Switches and Sensors



- ① Tension Regulator Switch (SE-60 Board)
- ② Tape End Sensor
- ③ REC OK Switch
- ④ Cassette-in Switch
- ⑤ Oxide/Metal Selector
- ⑥ Cassette Lock Switch
- ⑦ Dew Detect Sensor
- ⑧ Mechanical Function Control Sensor (SE-164 Board)
- ⑨ Tape Beginning Sensor

## 1-9. ERROR MESSAGE

### 1-9-1. Warning System

If a problem develops with the unit, the WARNING light, the tally light, the REC/TALLY indicator in the camera's viewfinder or the warning indicators on the lower part of the display panel will go on or flash. The tally light goes on and flashes at the same time as the camera's REC/TALLY indicator. When are monitoring the audio output with earphones, warning sounds can be heard from the EARPHONE jack.

#### Warnings and corrective actions

Warning indicator on the display panel	light/indicator on VTR/camera			Warning tone	VTR state	Cause	Corrective action
	VTR	Camera					
	WARNING light	REC/TALLY indicator	BATT indicator				
RF goes on.	4 flashes/sec during recording	4 flashes/sec		4 beeps/sec during recording	Recording continues, but is substandard.	Video head is clogged, or problem in recording circuits.	Clean the heads. If recording is still substandard, refer to Section 1-9-2. Diagnostic Mode.
SERVO goes on.	4 flashes/sec	4 flashes/ sec		4 beeps/sec	Recording continues, but is substandard.	Servo lock lost.	Turn OFF the POWER, and refer to Section 1-9-2. Diagnostic Mode.
HUMID goes on.	Goes on.	4 flashes/sec		4 beeps/sec if recording, else continuous tone.	Stops if mode is rewind, fast forward or playback. Continues if mode is record , but stops if tape sticks to drum.	Condensation	Stop the tape, and turn OFF the POWER. Wait until the HUMID indicator does not go on when POWER is turned ON. Refer to Section 1-16. Dew Condensation Release in case of emergency.
SLACK goes on.	4 flashes/sec	4 flashes/sec		Continuous tone.	VTR stops.	The tape cannot be wound properly.	Confirm the cause referring to Section 1-9-3. Cause of Tape Slack. Remove the tape referring to Section 1-18. Removal of cassette tape when tape slack occurred in the unit if necessary.

Warning indicator on the display panel	light/indicator on VTR/camera			Warning tone	VTR state	Cause	Corrective action
	VTR	Camera					
	WARNING light	REC/TALLY indicator	BATT indicator				
TAPE END flashes during recording. (1 flash/sec)	1 flash/sec during recording	1 flash/sec		1 beep/sec during recording	Recording continues.	Close to end of tape.	Change cassette tape if necessary.
TAPE END goes on.	Goes on.	4 flashes/sec		Continuous tone.	Recording, playback, fast forward stop.	End of tape	Change cassette tape, or rewind a tape.
BATT flashes. (1 flash/sec)	1 flash/ sec	1 flash/sec	1 flash/sec	1 flash/sec during recording	Operation continues.	Batteries are nearly exhausted.	Change batteries if necessary.
BATT goes on.	Goes on.	4 flashes/sec	Goes on.	Continuous tone	Operation stops.	Batteries are exhausted.	Change batteries.

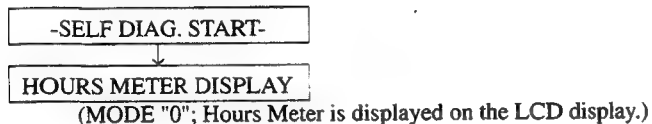


## 1-9-2. Diagnostic Mode

PVV-1P is provided with a diagnostic function. This function displays in the monitor display and the LCD display on the side panel. The LCD display also displays the hours meter, and more, battery before end voltage adjustment can also perform on this LCD display.

### Operation Procedure

1. Press the [DIAGNOSTIC] switch on the side panel with a pencil lead or similar object, and put into the DIAGNOSTIC mode.



2. Press the [ADVANCE] button on the side panel, and shift the mode step by step.
3. Press the [SHIFT] button, and perform the mode. Check referring to the following each mode.
4. When this DIAGNOSTIC mode is ended, press the [DIAGNOSTIC] switch again.

Mode Table

MODE		CONTENTS
LCD DISPLAY	MONITOR DISPLAY	
<div>0 R xx</div> <div>0 b xx</div> <div>0 C xx</div>	-SELF DIAG.START- ↓ after two seconds HOURS METER DISPLAY A.DRUM RUNNING xxH B.TAPE RUNNING xxH C.OPERATION xxH	Following contents are displayed. A.DRUM RUNNING METER B.TAPE RUNNING METER C.OPERATION METER It is recommended to perform the periodic checks and maintenance based on the hours meter. (Refer to Section 2-2. Hours Meter)
<div>1 xx.x</div>	BATTERY BEFORE VOLTAGE xx.xV	Display/set the voltage of battery before end. (Refer to Section 1-22. Voltage Change of Battery Before End)
<div>2</div> <div>           PB VTTC NDF EXT-LK 2FLD HOLD            88:88:88:88            H MIN SEC PM         </div>	LCD DISPLAY ALL ON/OFF ALL OFF ↓ LCD DISPLAY ALL ON/OFF ALL ON	Check that all characters are turned on or off on the LCD display. Every time the [SHIFT] button is pressed, all characters are turned on or off.
<div>3</div> <div>3-0</div> <div>or</div> <div>3-E</div>	EEPROM CHECK ↓ EEPROM CHECK CHECK OK or EEPROM CHECK CHECK NG	Confirm that EEPROM on TC-60P board is activated normally, and that TC-60P board circuit is operated normally. Press the [SHIFT] button, and followings are displayed on the LCD display. EEPROM : OK 3-0 EEPROM : NG 3-E When EEPROM is not activated normally, confirm TC-60P circuit or replace the EEPROM.

MODE		CONTENTS
LCD DISPLAY	MONITOR DISPLAY	
<div> <div>4    xx xx</div> <div>first next line line</div> <div>↓ after setting</div> <div>4-0    xx xx</div> <div>or</div> <div>4-E    xx xx</div> </div>	VITC INSERT LINE  xx LINE xx LINE	<b>VITC INSERT LINE SETTING</b> 1. Press the [SHIFT] button, and first line on the LCD display blinks. 2. Press the [ADVANCE] button, and select the first line. Selectable lines are in 12 through 21. After 21, it returns to 12 3. Press the [SHIFT] button, and next line blinks. Press the [ADVANCE] button, and select the next line as selecting first line. 4. Press the [SHIFT] button, the insert line is set.  SETTING : OK    4-0    xx xx SETTING : NG    4-E    xx xx  Shipped setting; 19 LINE 21 LINE
<div> <div>5    0</div> <div>or</div> <div>5    1</div> <div>↓ after setting</div> <div>5-0    x</div> <div>or</div> <div>5-E    x</div> </div>	SEARCH / FF.REW SELECT  FF.REW  or SEARCH / FF.REW SELECT  SEARCH	<b>SEARCH OR FF.REW SETTING</b> • Press the [FF] or [REW] button, the SEARCH mode or Fast Forward mode is set. Play back portion is confirmed by VF in the SEARCH mode. 1. Press the [SHIFT] button, and last figure of the LCD display blinks. In this time, "0" is the FF.REW mode, and "1" is the SEARCH mode. 2. Every time the [ADVANCE] button is pressed, it changes 1 or 0. 3. Press the [SHIFT] button, then the mode is set.  SETTING : OK    5-0    x SETTING : NG    5-E    x  Shipped setting; FF. REW
<div> <div>6</div> </div>	VTR STATUS-1  ↓ VTR STATUS-1 NTSC/PAL    PAL SCI-SV    OK  SCI-TC    OK  SYNC    EXIST  C.F.PULSE    EXIST  TAPE TOP    NOT DET  TAPE END    NOT DET  HUMID    NOT DET	<b>VTR STATUS-1</b> VTR STATUS-1 is displayed on the monitor display. • Press the [SHIFT] button, and followings are displayed.  NTSC or PAL is displayed. Serial communication between system control and servo is displayed. If fault, "NG" is displayed. Serial communication between system control and time code is displayed. If fault, "NG" is displayed. Whether there is SYNC input or not is displayed. When there is no SYNC input, "NOT EXIST" is displayed. Whether there is CF PULSE input or not is displayed. When there is no CF PULSE input, "NOT EXIST" is displayed. Condition of the TAPE TOP sensor is displayed. When TAPE TOP is detected, "DETECT" is displayed. Condition of the TAPE END sensor is displayed. When TAPE END is detected, "DETECT" is displayed. Condition of the HUMID sensor is displayed. When HUMID is detected, "DETECT" is displayed.

MODE		CONTENTS
LCD DISPLAY	MONITOR DISPLAY	
7	VTR STATUS-2 ↓ VTR STATUS-2  CURRENT MODE STOP LAST MODE PLAY CAM POSITION STOP CAPSTAN STOP DRUM STOP REEL STOP (ERROR CAUSE) -----	VTR STATUS-2 VTR STATUS-2 is displayed on the monitor display. • Press the [SHIFT] button, and following are displayed.  Current VTR mode is displayed. Last VTR mode is displayed Cam gear position of the mechanical sensor is displayed. Condition of the capstan motor is displayed. Condition of the drum motor is displayed. Condition of the reel motor is displayed Only when tape slack is occurred, cause of tape slack is displayed. "SLACK" is displayed at CURRENT MODE, and "MODE (when tape slack is occurred)" is displayed at LAST MODE.  ERROR CODE DISPLAY When tape slack is occurred, its error cause and its error mode are displayed on the LCD display. E-xx ↓ MODE 0:STOP 1:REC 2:THREAD/UNTHREAD 3:REC PAUSE 6:FF A:REW C:PLAY  ERROR CAUSE 1:REEL 2:ROTOR 3:THREAD MOTOR 4:DRUM 5:CAPSTAN 6:TENSION REGULATOR
E-xx		
B	SERIAL I/O PORT STATUS ↓ SERIAL I/O PORT STATUS  SERVO OUT xx xx xx a b c IN xx xx xx d e f  TC OUT xxxx xxxx xxxx g h IN xxxx xxxx i j  AUDIO OUT xxxx k	SYSTEM CONTROL MICOM SERIAL I/O PORT STATUS Serial communication between system control and servo, or time code, or audio is displayed. • Press the [SHIFT] button, input/output state is displayed. 1. SYSTEM CONTROL TO SERVO 2. SYSTEM CONTROL TO TIME CODE 3. SYSTEM CONTROL TO AUDIO  Each byte of "a" through "k" byte is as follows.  SERVO OUT (SYSCON→SERVO) a BYTE BIT-7 -6 -5~-3 BATTERY VOLTAGE (V) 001:13.00~ 010:12.00~13.00 011:11.75~12.00 100:11.50~11.75 101:11.25~11.50 110:11.00~11.25 -2 1:SERVO PB ON -1 1:SERVO REC ON -0 1:SERVO FF/REW  b BYTE BIT-7 CAPSTAN CMD 1:ON -6 CAPSTAN CMD 1:FWD/0:REV -5 1:TAPE REMAIN RESET -4 1:TAPE FLAG RESET -3 -2~-0 CAPSTAN CMD SPEED 000:STOP 100:x1 010:x1/6 011:x1/2  c BYTE BIT-7 REEL CMD 1:ON -6 REEL CMD 1:FWD/0:REV -5~-3 REEL CMD SPEED 011:1/3 101:3 100:1 110:4 -2 REEL BRAKE ON -1 REEL BRAKE OFF -0 REEL CMD 1:V MODE/0:I MODE

MODE		CONTENTS
LCD DISPLAY	MONITOR DISPLAY	
<b>B</b>		<p>SERVO IN (SERVO→SYSCON)</p> <p><b>d BYTE</b>            BIT-7 1:TAPE END            -6 1:TAPE TOP            -5 1:TAPE BEFORE END            -4 _____            -3 _____            -2 REEL STATUS 1:STOP            -1 REEL STATUS 1:FWD/0:REV            -0 REEL STATUS 1:ROTATE</p> <p><b>e BYTE</b>            BIT-7 CAPSTAN STATUS 1:STOP            -6 CAPSTAN STATUS 1:FWD/0:REV            -5 CAPSTAN STATUS 1:ROTATE            -4 CAPSTAN STATUS 1:LOCK            -3 _____            -2~-0 CAPSTAN STATUS SPEED (SERVO OUT b byte BIT-2 to 0 are the same.)</p> <p><b>f BYTE</b>            BIT-7 1:REV SW ON            -6~-0 _____</p> <p>TC OUT (SYSCON→TC)</p> <p><b>g BYTE</b>            BIT-7 1:AUDIO FF/REW            -6 _____            -5 _____            -4 1:SLACK DISPLAY ON            -3 1:TC PB ON            -2 _____            -1 TAPE 1:RUN/0:STOP            -0 DRUM 1:ON/0:OFF</p> <p><b>h BYTE</b>            BIT-7 1:RF ALARM ON            -6 1:SERVO ALARM ON            -5 1:HUMID ALARM ON            -4 1:SLACK ALARM ON            -3 1:TAPE END ALARM ON            -2 1:BATTERY END ALARM ON            -1 _____            -0 1:ALARM TONE ON</p> <p>TC IN (TC→SYSCON)</p> <p><b>i BYTE</b>            BIT-7 1:DIAG SW ON            -6 TC 1:NDF/0:DF            -5 1:CTDM SW ON            -4 1:NR SW ON            -3 _____            -2 1:REGEN SW ON            -1 1:BATTERY END            -0 1:BATTERY BEFORE END</p> <p><b>j BYTE</b>            BIT-7 _____            -6 1:LCD ALL ON            -5 1:EEPROM OK            -4 1:SEARCH/0:FF REW            -3 _____            -2 _____            -1 _____            -0 _____</p> <p>AUDIO OUT (SYSCON→AUDIO)</p> <p><b>k BYTE</b>            BIT-7 0:NR ON            -6 0:OSC ON            -5 _____            -4 1:AUDIO PB ON            -3 1:REC AMP MUTE            -2 _____            -1 1:AUDIO MUTE            -0 1:AUDIO REC ON</p>

MODE		CONTENTS
LCD DISPLAY	MONITOR DISPLAY	
9	I/O PORT STATUS ↓ I/O PORT STATUS bit 76543210 0 P-A xxxxxxxx P-K x P-B xxxxxxxx P-C xxxxxxxx P-D xxxxxxxx P-E xxxxxxxx P-F xxxxxxxx P-G xxxxxxxx P-H xxxxxxxx P-I xxxxxxxx P-J xxxxxxxx	SYSTEM CONTROL MICOM PARALLEL I/O PORT STATUS Parallel I/O port of system control micom is displayed on the monitor display. • Press the [SHIFT] button, condition of port is displayed by "1" or "0".  Contents are as follows. <div> <div> PA-7 0:CTL REC  -6 0:TC REC  -5 0:VIDEO REC ON  -4 1:CTL UP/0:CTL DOWN  -3 1:VIDEO PB/0:VIDEO EE  -2 1:VF PB/0:VF CAM  -1 0:BATT IND  -0 0:REC TALLY </div> <div> PB-7 _____  -6 _____  -5 THREAD MOTOR FWD  -4 THREAD MOTOR REV  -3 _____  -2 _____  -1 _____  -0 _____ </div> </div> <div> <div> PC-7 1:TENREG RELEASE  -6 0:CASSE'CON LOCK  -5 0:CASSETTE IN  -4 0:METAL REC OK  -3 1:METAL/0:OXIDE  -2 _____  -1 _____  -0 _____ </div> <div> PD-7 1:NTSC/0:PAL  -6 0:CHARACTER GENE BUSY  -5 0:SERVO READY  -4 0:TC READY  -3 0:SYNC EXIST  -2 _____  -1 0:CF EXIST  -0 0:HUMID </div> </div> <div> <div> PE-7 _____  -6 0:SV CS  -5 _____  -4 _____  -3 _____  -2 _____  -1 _____  -0 _____ </div> <div> PF-7 _____  -6 _____  -5 _____  -4 _____  -3 ROTOR 3  -2 ROTOR 2  -1 ROTOR 1  -0 ROTOR 0 </div> </div> <div> <div> PG-7 CAPSTAN DIR 1:FWD/0:REV  -6 1:RF DETECT  -5 0:SLACK MUTE ON  -4 _____  -3 _____  -2 _____  -1 _____  -0 _____ </div> <div> PH-7 0:WARNING LAMP ON  -6 0:TC CS  -5 0:CHARACTER CS  -4 0:CHARACTER ON  -3 1:POWER SAVE  -2 0:REW LAMP ON  -1 0:FF LAMP ON  -0 0:PLAY LAMP ON </div> </div> <div> <div> PI-7 _____  -6 _____  -5 _____  -4 _____  -3 _____  -2 _____  -1 _____  -0 _____ </div> <div> PJ-7 0:EJECT SW ON  -6 0:STOP SW ON  -5 0:PLAY SW ON  -4 0:FF SW ON  -3 0:REW SW ON  -2 0:REC REVIEW SW ON  -1 0:VTR SAVE SW ON  -0 0:VTR START/STOP SW ON </div> </div> <div> <div> PK-0 _____ </div> </div>



### 1-9-3. Cause of Tape Slack

The unit has the system that when slack lamp goes on, it stoppes VTR operation.

Refer to section 1-9-2 Diagnostic Mode "mode 7" about VTR's mode and display of error cause when tape slack is occured.

Contents of tape slack cause are as follows.

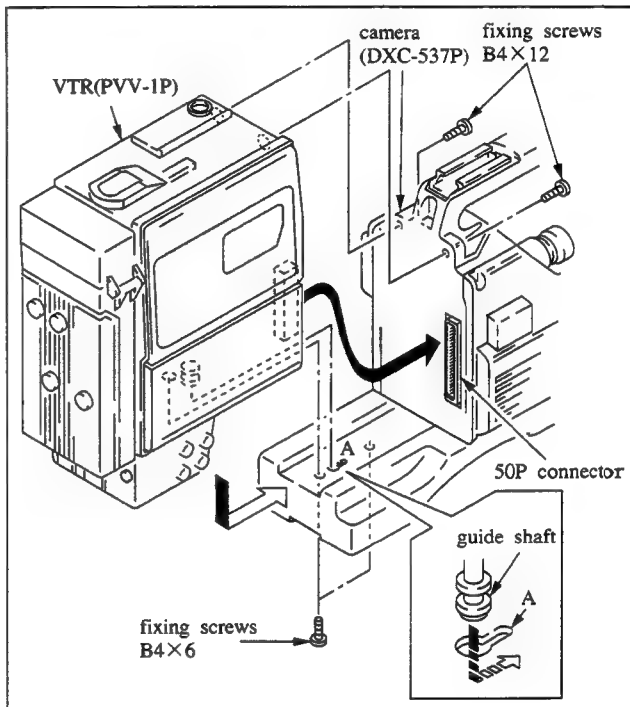
VTR'S MODE	CAUSE OF TAPE SLACK	LCD DISPLAY E-xx	MONITOR DISPLAY ERROR CAUSE xx
During STOP (STANDBY)	When the drum rotation stops and ROTATE is not detected.	04	DRUM
During REC	When T reel table rotation stops and ROTATE is not detected.	11	REEL
	When the drum rotation stops and ROTATE is not detected.	14	DRUM
	When the capstan rotation stops and ROTATE is not detected.	15	CAPSTAN
	When the tension regulator is released and TENREG RELEASE signal becomes L level.	16	TENSION REGULATOR
During THREAD	When threading operation does not stop after 10 seconds from starting the drive of the threading motor.	23	THREAD MOTOR
	When the drum rotation stops and ROTATE is not detected.	24	DRUM
During UNTHREAD	When T reel table rotation stops and ROTATE is not detected.	21	REEL
	When threading operation does not stop after 10 seconds from starting the drive of the threading motor.	23	THREAD MOTOR
During REC PAUSE (STANDBY)	When the drum rotation stops and ROTATE is not detected.	34	DRUM
During FF or FWD SEARCH	When T reel table rotation stops and ROTATE is not detected.	61	REEL
	When the drum rotation stops and ROTATE is not detected.	64	DRUM
During REW or REV SEARCH	When S reel table rotation stops and ROTATE is not detected.	A1	REEL
	When the drum rotation stops and ROTATE is not detected.	A4	DRUM
During PLAY	When T reel table rotation stops and ROTATE is not detected.	C1	REEL
	When the drum rotation stops and ROTATE is not detected.	C4	DRUM
	When the capstan rotation stops and ROTATE is not detected.	C5	CAPSTAN
	When the tension regulator is released and TENREG RELEASE signal becomes L Level.	C6	TENSION REGULATOR
During Change Mode	When ROTOR POSITON data of desired mode is not gained, and change mode operation does not stop after 3 seconds from starting the drive cam and changing mode.	X2   Desired mode is displayed.	ROTOR

## 1-10. PRINTED CIRCUIT BOARDS

SYSTEM	BOARD	CIRCUIT FUNCTION
VIDEO	VO-34P	VIDEO REC/PB
	IO-61	BNC CONNECTOR
AUDIO	AU-144P	AUDIO REC/PB
	TC-60P	AUDIO LINE/METER AMP
	CN-504	MIC AMP
	CN-560	AUDIO XLR CONNECTOR
	HP-50	EARPHONE
	AH-36	AUDIO HEAD
TIME CODE	TC-60	TIME CODE
SERVO	SS-46P	SERVO SYSTEM
SYSTEM & CONTROL	SS-46P	SYSTEM CONTROL
	KY-211	FUNCTION KEY
	SE-60	TENSION REGULATOR SENSOR
	SE-164	MECHANICAL SENSOR, DEW SENSOR RELAY
	SW-457	BACKTALLY SWITCH
POWER	CN-505	DC INPUT POWER/BREAKER
	SW-474	RELAY
	HP-50	BREAKER
OTHERS	CN-504	PHANTOM ON/OFF SWITCH
	MB-362	CAMERA 50P CONNECTOR
	MB-363	MOTHER BOARD

## 1-11. INSTALLATION OF VTR AND CAMERA

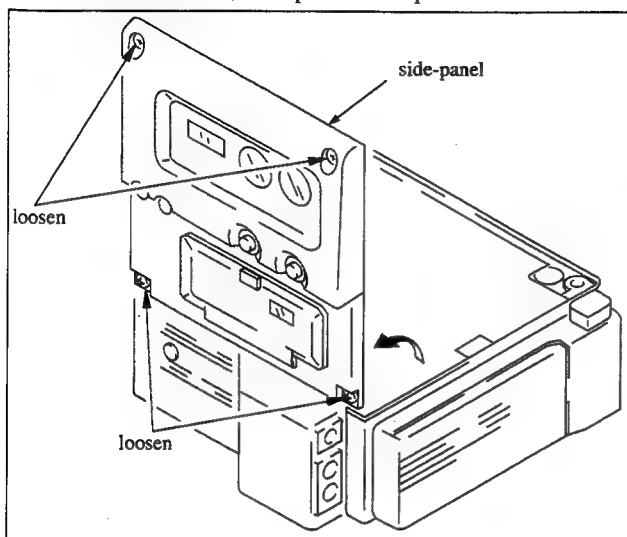
1. Align the projection of the VTR into the slot of the camera (DXC-537P). Slide the VTR in the direction of the arrow, and press it so that the 50-pin connector is firmly fixed.
2. Install two +B 4×12 screws (supplied) near the camera's grip, and +B 4×6 screws (supplied) on the camera's shoulder pad.
3. Remove the VTR from the camera in the reverse order of steps 1 and 2.



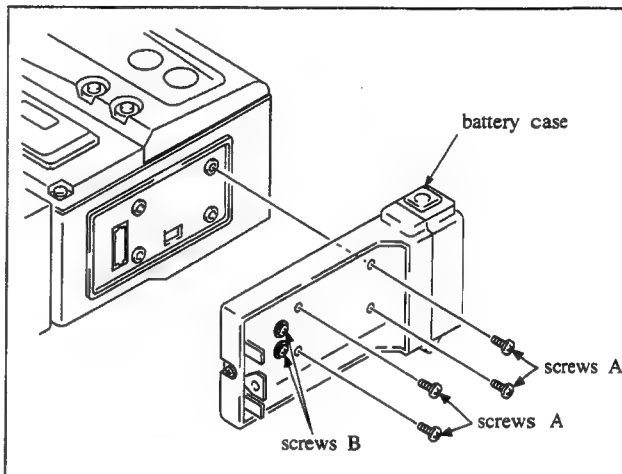
## 1-12. CABINET REMOVAL

### SIDE PANEL

1. Loosen four screws, and open the side panel.

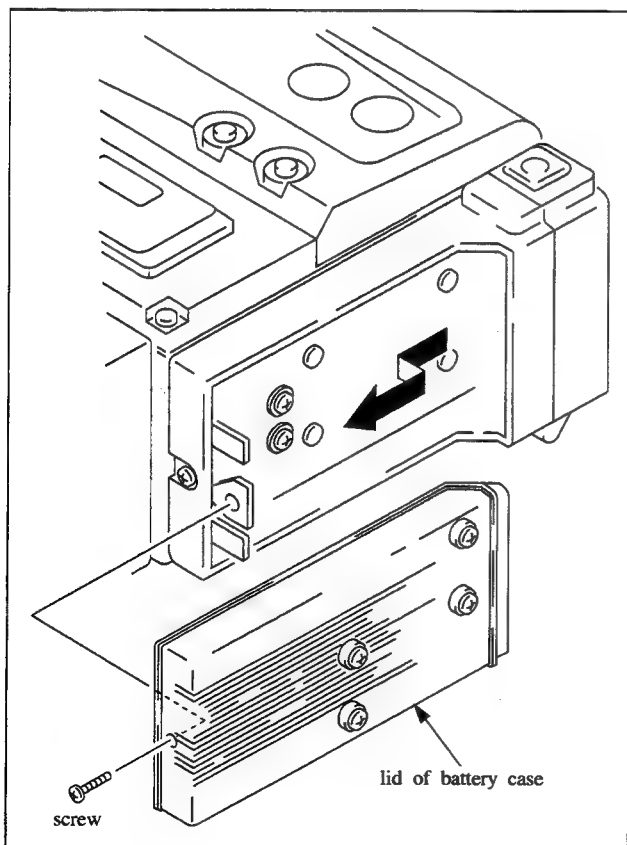


2. Remove four A screws shown in the figure.
3. Loosen two B screws, and remove the battery case from the unit.



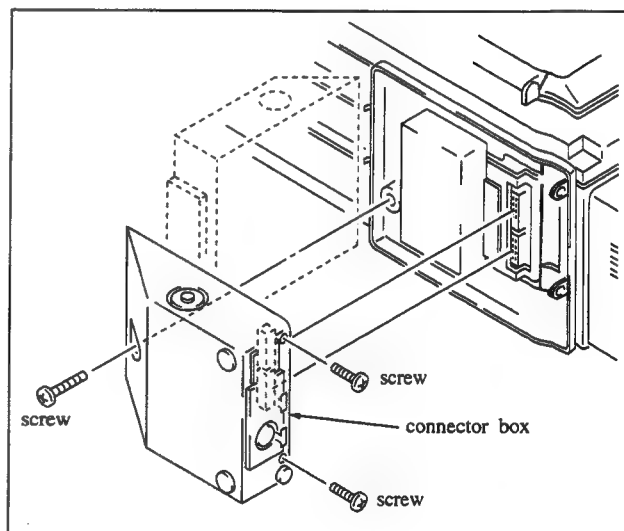
### BATTERY CASE

1. Remove one screw, and remove the lid of battery case moving in the direction of the arrow.



### CONNECTOR BOX

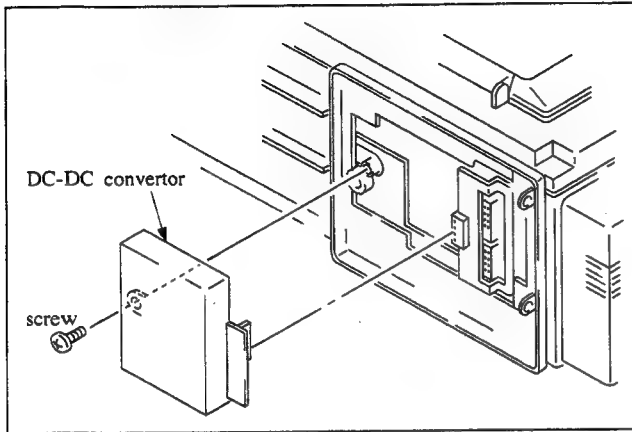
1. Remove three screws.
2. Disconnect the connector, and remove the connector box.



**Note:** Since the PVV-1AP has a harness for the 20P connector, the connector box should be opened as indicated by the dotted line on the chart.

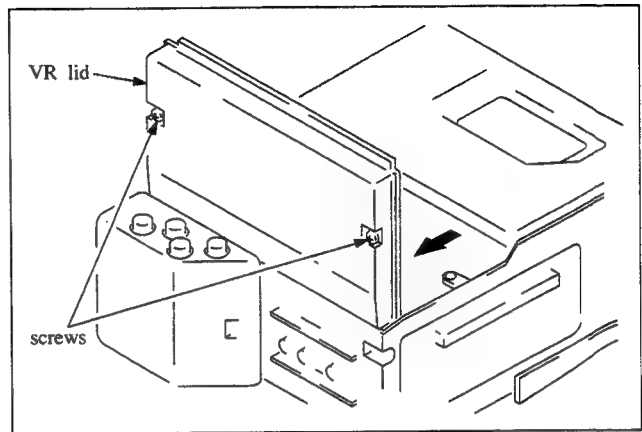
### DC-DC CONVERTOR

1. Remove the connector box.
2. Remove one screw.
3. Disconnect the connector, and remove the DC-DC convertor.



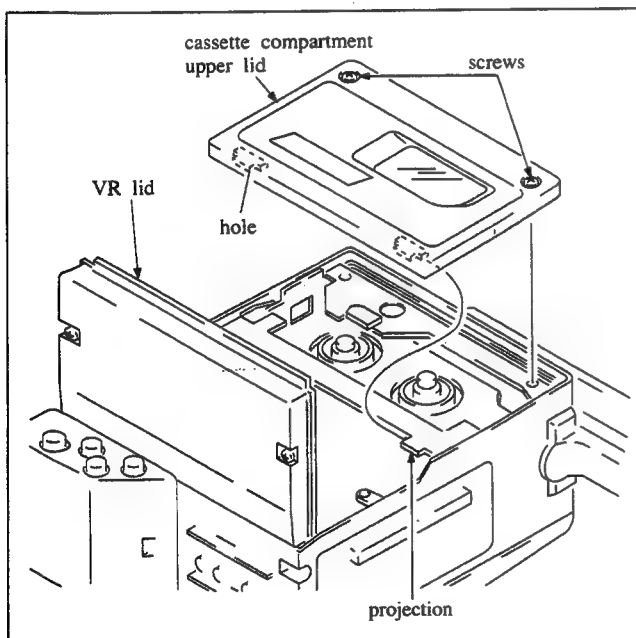
### VR LID

1. Loosen two screws.
2. Slide the VR lid in the direction of the arrow, and open the VR lid.



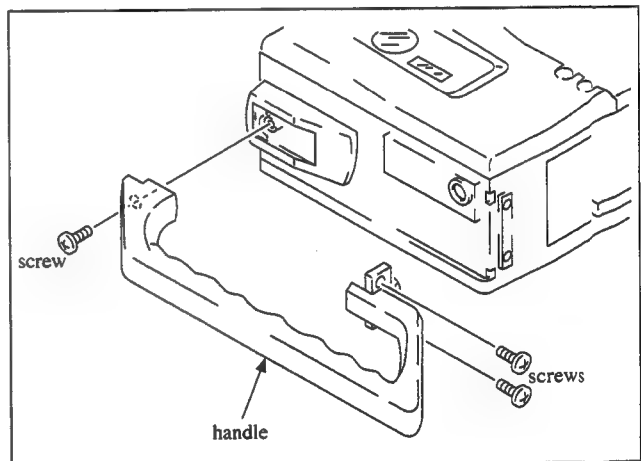
### CASSETTE COMPARTMENT UPPER LID

1. Loosen two screws, and open the VR lid.
2. Loosen two screws on the cassette compartment upper lid.
3. Remove the holes of the cassette compartment upper lid from the projections of the cassette compartment chassis, and remove the cassette compartment upper lid.



### HANDLE

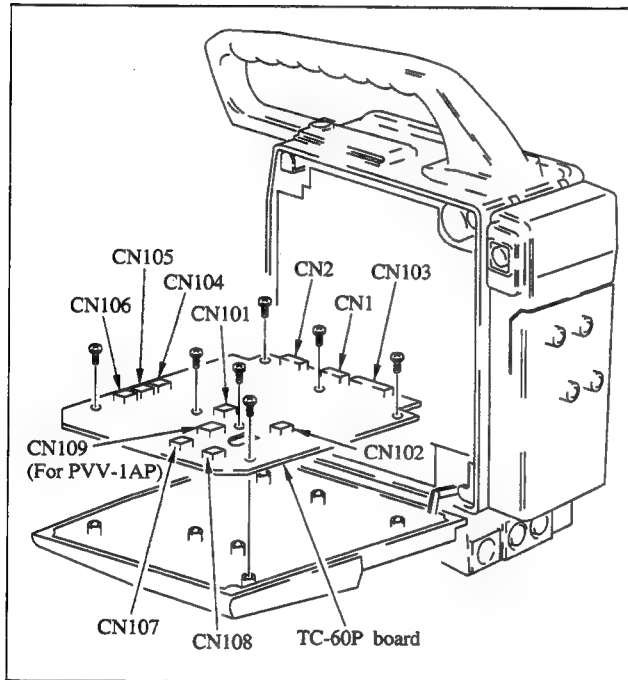
1. Remove tree screws, and remove the handle.



## 1-13. BOARDS REPLACEMENT

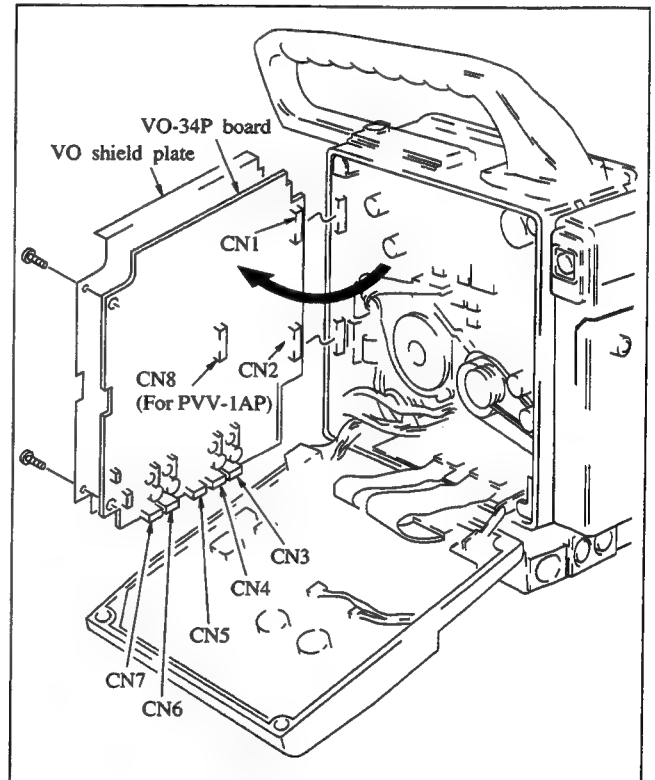
### 1-13-1. TC-60P Board Replacement

1. Loosen four screws, and open the side panel.
2. Disconnect ten connectors (CN1, 2, 101 through 108), and remove seven screws.  
At PVV-1AP, disconnect eleven connectors (CN1, 2, 101 through 109).
3. Remove TC-60P board from the side panel.
4. Install TC-60P board in the reverse order of steps 1 through 3.



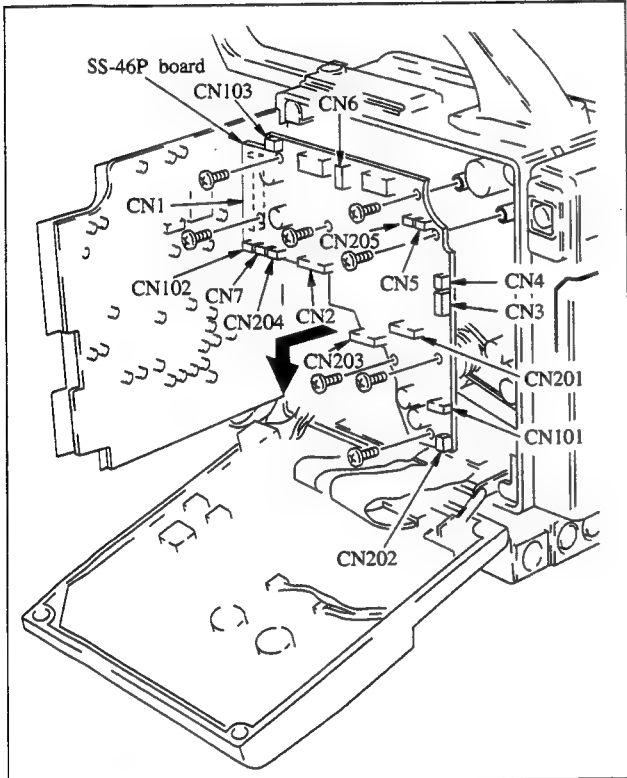
### 1-13-2. VO-34P Board Replacement

1. Loosen four screws, and open the side panel.
2. Remove two screws and open VO-34P board, and remove VO shield plate.
3. Disconnect seven connectors (CN1 through CN7), and remove VO-34P board.  
At PVV-1AP, disconnect eight connectors (CN1 through CN8).
4. Install VO-34P board in the reverse order of steps 1 through 3.

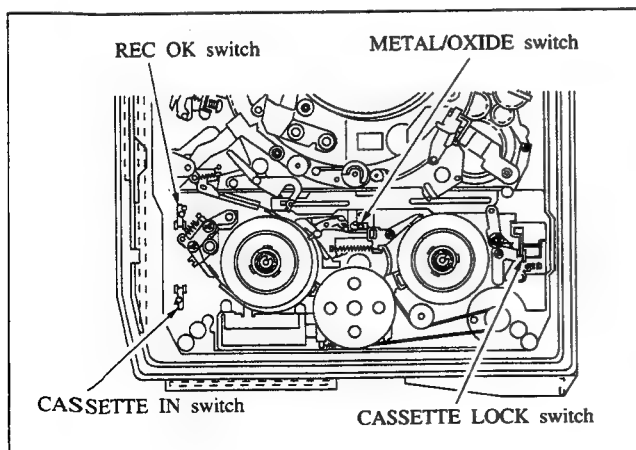


### 1-13-3. SS-46P Board Replacement

1. Loosen four screws, and open the side panel.
2. Remove two screws, and open VO-34P board.
3. Disconnect fifteen connectors. (CN1 through CN7, CN101 through CN103, CN201 through CN205)
4. Remove eight screws and SS-46P board in direction of the arrow.

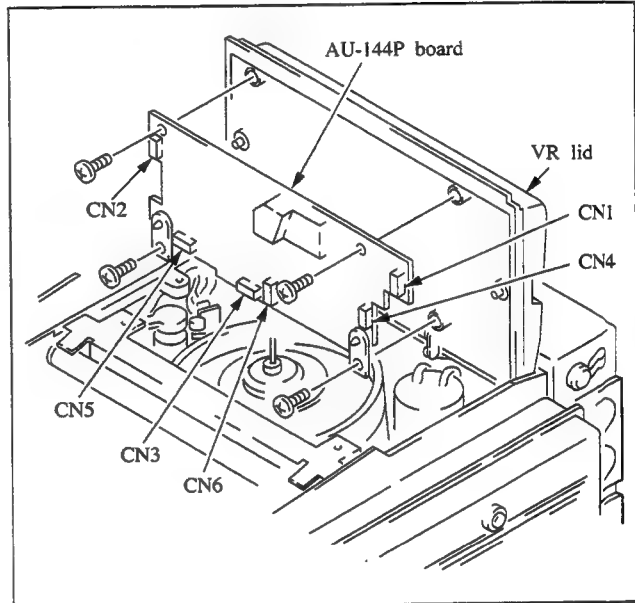


5. Install SS-46P board in the reverse order of steps 1 through 4.
6. After SS-46P board installation, remove the cassette compartment. Push four switch buttons (CASSETTE LOCK, CASSETTE IN, REC OK, METAL/OXIDE), and make sure that they move back to their original position.



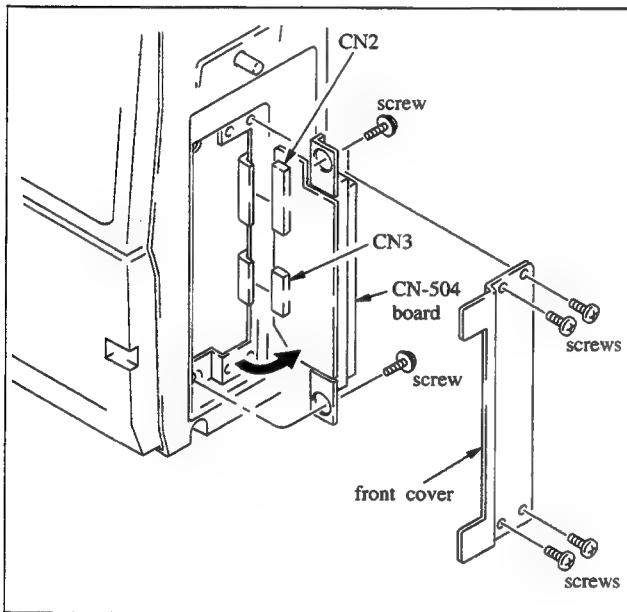
### 1-13-4. AU-144P Board Replacement

1. Loosen two screws and open the VR Lid. (Refer to Section 1-12. Removal of cabinet)
2. Loosen the clampers, and disconnect six connectors (CN1 through CN6).
3. Remove four screws, and remove AU-144P board.
4. Install AU-144P board in the reverse order of steps 1 through 3.



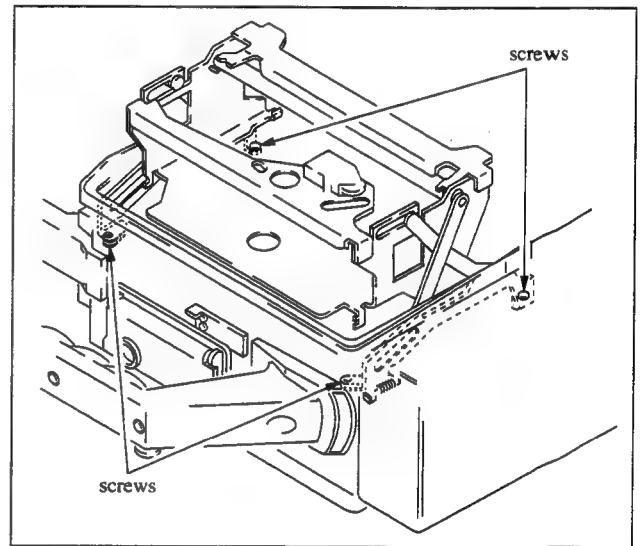
#### 1-13-5. CN-504 Board (50 Pin Camera Connector) Replacement

1. Remove four screws, and remove the front cover.
2. Remove two screws, and open CN-504 board.
3. Pull out the flexible card wires (CN2,3) slowly, and disconnect them. (Refer to Section 1-15-3. Replacement of Flexible card wires.)
4. Install CN-504 board in the reverse order of steps 1 through 3.



#### 1-14. THE CASSETTE COMPARTMENT REMOVAL

1. Open the VR lid, and remove the cassette compartment lid. (Refer to Section 1-12. Cabinet Removal.)
2. Press the EJECT button, so that make the cassette compartment is in up state. (When the power supply is not available, refer to Section 1-20.)
3. Loosen the four screws shown in the figure. Remove the cassette compartment.
4. Install the cassette compartment in the reverse order of steps 1 through 3.



## 1-15. NOTES ON REPAIR PARTS

### 1-15-1. Notes on Repair Parts

#### 1. Safety Related Components Warning

Components marked with  $\Delta$  on the schematic diagrams, exploded views and electrical repair parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear in this manual or in service bulletins and service manual supplements published by Sony.

#### 2. Standardization of Parts

Repair parts supplied from Sony Parts Center may not always be identical with the parts actually in use due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".

This manual's exploded views and electrical repair parts list indicate the part numbers of "the standardized genuine parts at present".

#### 3. Change of Parts

Regarding engineering parts changes, refer to section 14 "CHANGED PART".

#### 4. Stock of Parts

Parts marked with "o" SP(Supply Code)column of the repair parts list are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

#### 5. Units for Capacitors and Resistors

The following units may be assumed in schematic diagrams, electrical parts list and exploded views unless otherwise specified.

Capacitors:  $\mu\text{F}$

Resistors : ohm

### 1-15-2. Replacement Procedure for Chip Parts

#### Required Tools

Soldering iron 20W; If possible, use a soldering iron tip heat-controller at  $270 \pm 10^\circ\text{C}$

Braided wire; SOLDER TAUL or equivalent  
Sony part No. 7-641-300-81

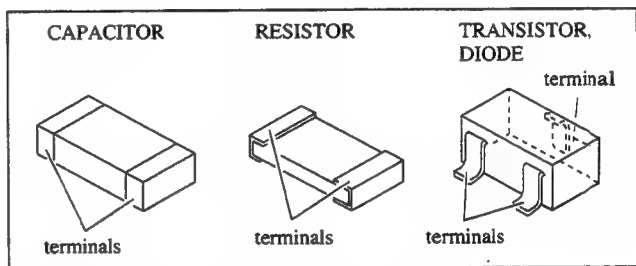
Solder; 0.6 mm dia. is recommended.

Tweezers

#### Soldering conditions

Soldering iron temperature;  $270 \pm 10^\circ\text{C}$

Soldering time; Less than two seconds per a pin



#### Resistor and Capacitor Replacement

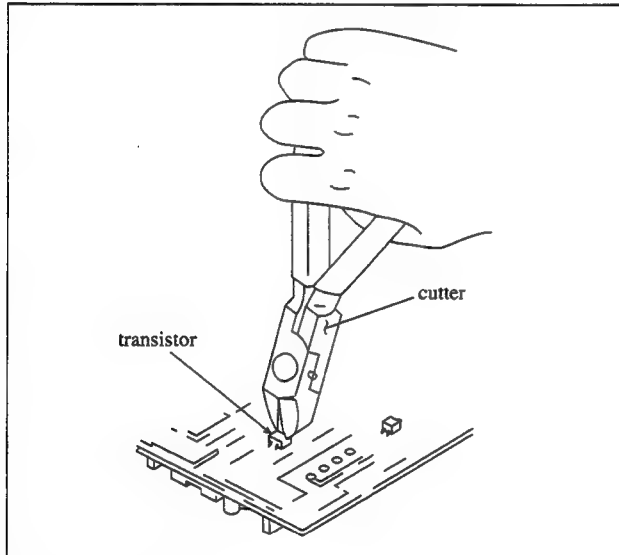
1. Place the soldering iron tip onto the chip part and heat it up until the solder is melted. When the solder is melted, slide the chip part aside.
2. Make sure that there is no pattern peeling, damage and/or bridges around the desoldering positions.
3. After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
4. Place new chip part in the desired position and solder both ends.

**Note:** Once a chip part has been removed, never use it again.



### Transistor and Diode Replacement

1. Cut the terminals of the chip part with cutters.
2. Remove the cut leads with soldering iron.
3. Make sure that there is no pattern peeling, damage and/or bridges around the desoldering positions.
4. After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
5. Place new chip part in the desired position and solder the terminals.



### IC Replacement

1. Using the braided wire, "SOLDER TAUL" Sony Part No. 7-641-300-81, remove the solder around the pins of the IC-chip to be removed.
2. While heating up the pins, remove the pins one by one using sharp-pointed tweezers.
3. Make sure that there is no pattern peeling, damage and/or bridges around the desoldering positions.
4. After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
5. Place new chip part in the desired position and solder the pins.

### 1-15-3. Replacement of Flexible Card Wires (15P,16P, 20P,25P,26P)

15P and 20P flexible card wires are used on between CN-504 board and MB-362 board. 25P flexible card wire is used on between MB-362 board and MB-363 board. 16P and 26P flexible card wires are used on between MB-363 board and TC-60P board.

When handling a flexible card wire, be very careful not to bend it because this will markedly reduce its life.

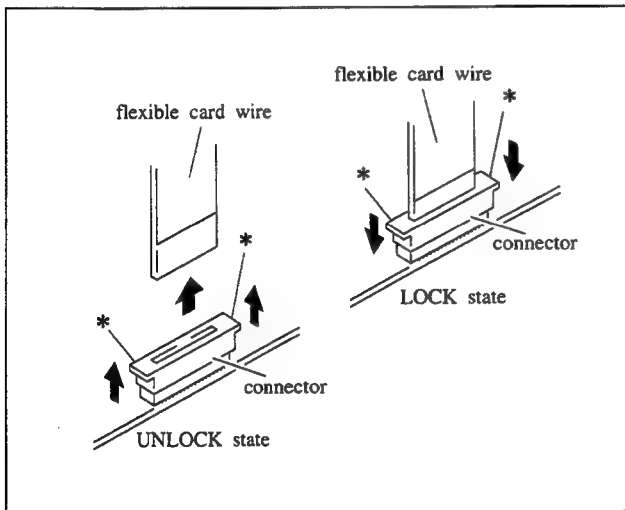
#### <Straight Type>

##### Disconnecting procedure

Pull up the \* marked portions of connector, and pull out the flexible card wire from the connector.

##### Installing procedure

Install the flexible card wire as far as it will go (up to the line indicated on the flexible card wire) and push down the \* marked portions of connector.



#### <Angle Type>

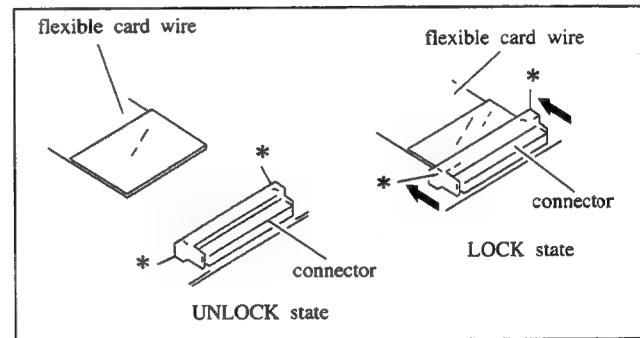
##### Disconnecting procedure

Slide the \* marked portions of connector in the direction of the arrows, pull up the connector, and then pull out the flexible card wire from the connector.

##### Installing procedure

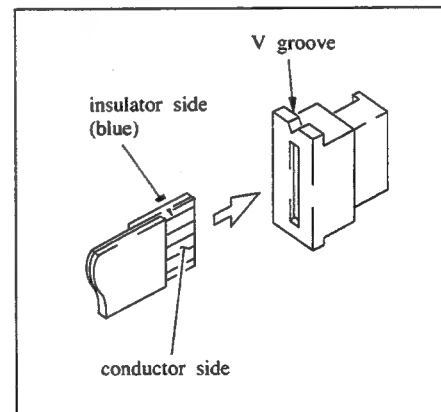
Pull up the \* marked portions of the connector, insert the flexible card wire so that its conductor side is facing the printed circuit board, and insert it as far as it will go (up to the line indicated on the flexible card wire).

Push down the \* marked portions, then the slide it in the opposite direction of the arrow to lock.



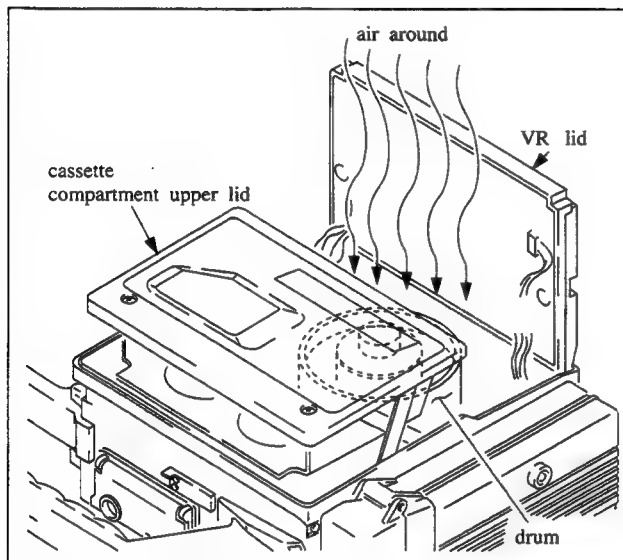
**NOTE:** The flexible card wire consists of conductor side and insulator side.

The flexible card wire must be inserted with the conductor side facing the correct way. If it is not the circuit will not work.



### 1-16. DEW CONDENSATION (HUMID GOES ON) RELEASE

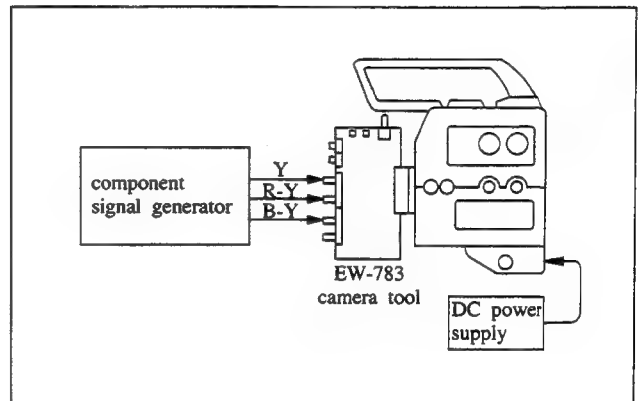
1. Press the EJECT button, and remove the cassette tape.
2. Turn the power OFF.
3. Loosen two screws and open the VR lid.
4. Dew condensation is released soon by sending the air around the drum to make the drum and outside temperature the same.



**Note:** When condensation have occurred on the drum surface, video head may be clogged. Confirm the head are clogged or not, and clean the head according to the need.

### 1-17. PUT THE VTR INTO THE REC MODE WITHOUT CONNECTING A CAMERA

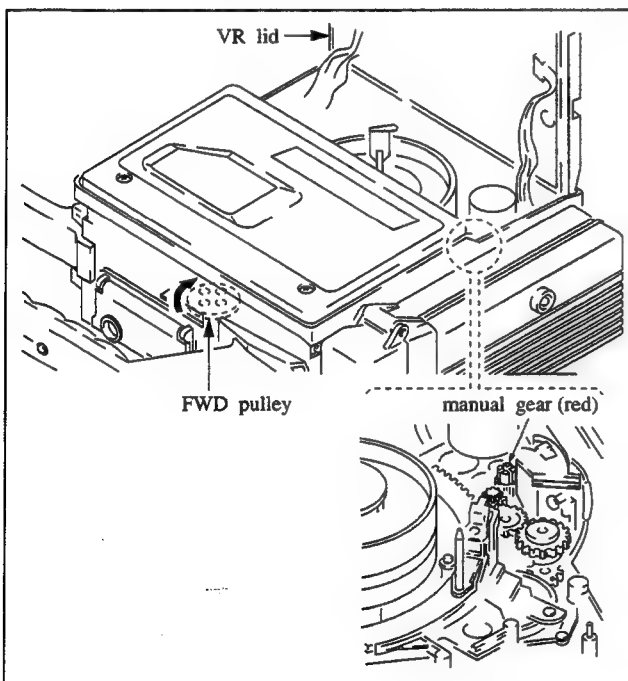
The PVV-1P cannot record the video and audio signals without connecting a camera. Therefore, in order to put VTR into the REC mode without connecting the camera, it is necessary to use the camera tool "EW-783". Use the camera tool (EW-783) to input the component signal from the component signal generator. The VTR is in REC mode.



### 1-18. REMOVAL OF CASSETTE TAPE WHEN TAPE SLACK IS OCCURRED IN THE UNIT

If either the cassette cannot be ejected or the cassette compartment does not rise up due to a fault, perform the following procedures to remove the cassette.

1. Loosen two screws and open the VR lid.
2. Secure the cassette compartment with vinyl tape in order to stop the sudden rise of the cassette compartment during rewinding. Then perform the following procedures.
3. While rotating the manual gear by + screwdriver counterclockwise, rotate the FWD pulley by hand as shown in the direction of the arrow to take up the tape taking out from the cassette. Be sure not to rotate the manual gear further on where the threading ring stops. Be careful not to damage the tape which remains in the unit.
4. Take up the tape which remains in the unit. Remove the vinyl tape securing cassette compartment. Rotate the manual gear to release the mechanical lock of cassette compartment, and make it in up state. Do not rotate the manual gear any further after the cassette compartment is up. The manual gear may be damage. Take out the cassette tape from the unit.
5. After cassette tape removal, rotate the manual gear clockwise to lock the cassette compartment. Stop the manual gear just before the loading ring rotates. When the manual gear over-rotate, rotate the manual gear counterclockwise so that the loading ring moves back.



## 1-19. CLEANING WHEN HEAD CLOGGED OCCURRED

In case the heads are clogged, carry out the following procedures to clean it.

1. Clean the video head and Audio head with cleaning cassette. Refer to the supplied operation manual for use.

Cleaning cassette BCT-5CLN

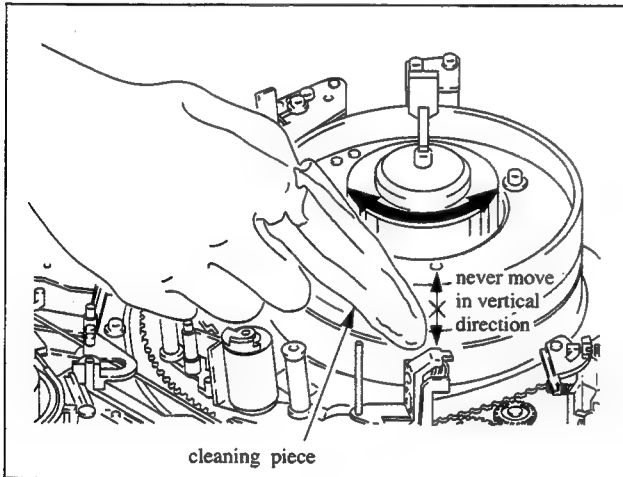
2. Clean the head and the tape transport surface with the cleaning piece and the cleaning fluid. After cleaning, make sure not to insert tape before the cleaning fluid evaporates completely.

Cleaning piece 2-034-679-00

Cleaning fluid 9-919-573-01

- (1) Video Head

Press the cleaning piece moistened with the cleaning fluid gently with the drum, and turn the drum slowly with hand.

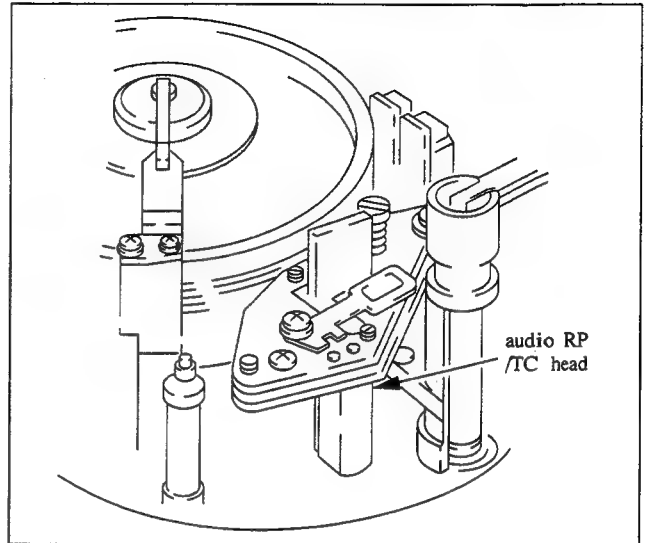


### NOTE:

- Never move the cleaning piece in the vertical direction toward the drum when cleaning.
- Be sure to turn the power OFF, and perform the cleaning.

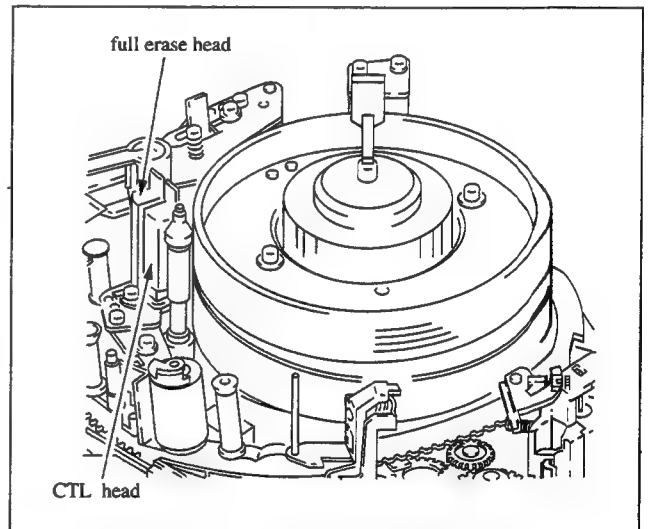
- (2) Audio RP/TC Head

Clean with the cleaning piece moistened with cleaning fluid.



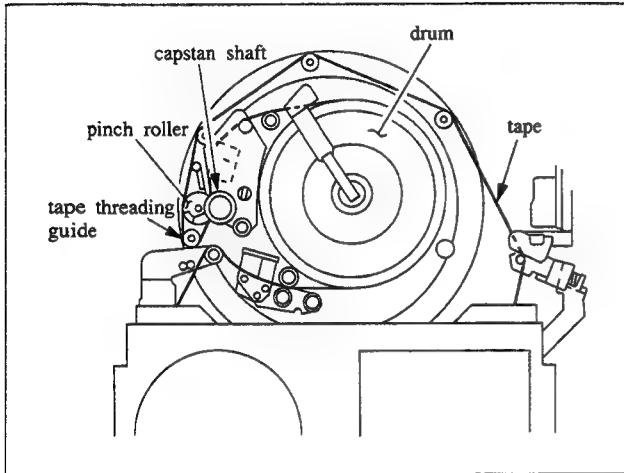
- (3) CTL, full erase Head

Clean with the cleaning piece moistened with cleaning fluid.



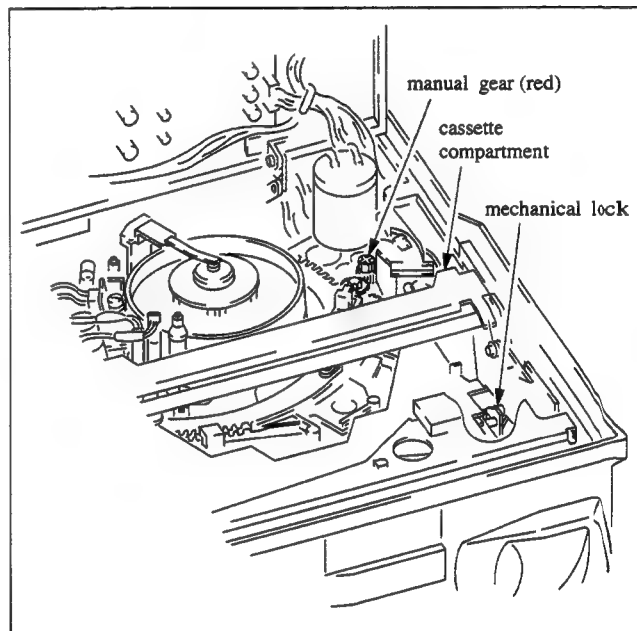
(4) Tape running surface

Clean the areas where the video tape is in contact with the cleaning piece moistened with cleaning fluid; Tape guides, upper/lower drum, capstan and the pinch roller as shown in the figure.



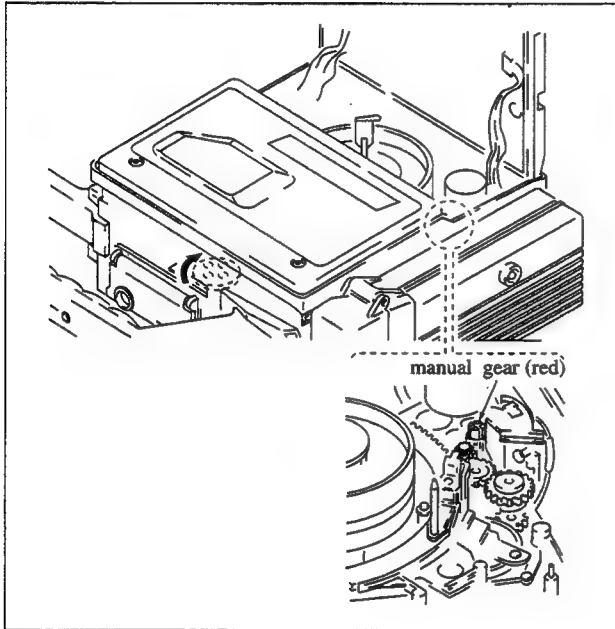
**1-20. WHEN POWER IS NOT AVAILABLE, HOW TO MAKE THE CASSETTE COMPARTMENT UP STATE**

1. Open the VR lid, and remove the cassette compartment lid. (Refer to section 1-12. Cabinet Removal)
2. Rotate the manual gear in the counterclockwise direction and the release mechanical lock of the cassette compartment so that the cassette compartment up state is obtained.
3. To make the cassette compartment in down state, rotate the manual gear in the clockwise direction and make it in lock state. Make the cassette compartment in down state.



## 1-21. MANUAL GEAR

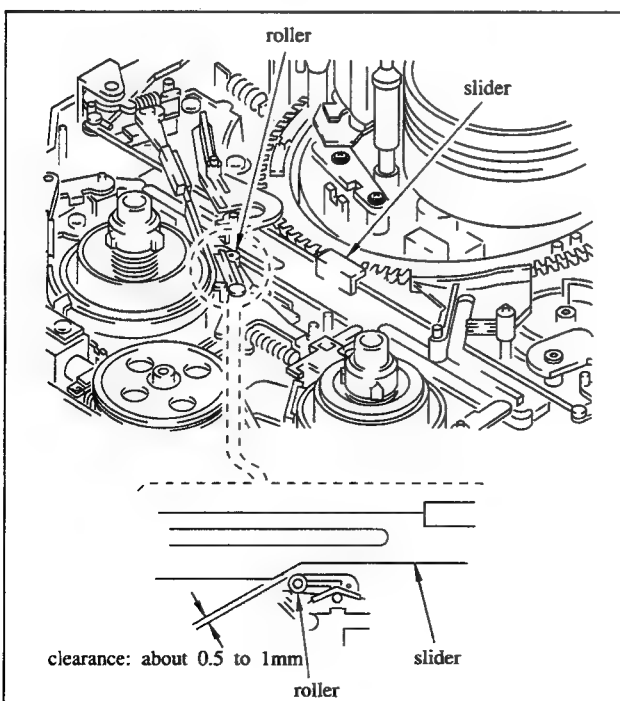
When a power supply is not available, by rotating the manual gear, the mechanical modes are obtained as shown in the each following state.



### 1. Threading end mode

Threading end mode means that the threading ring rotates in the counterclockwise direction and stops.

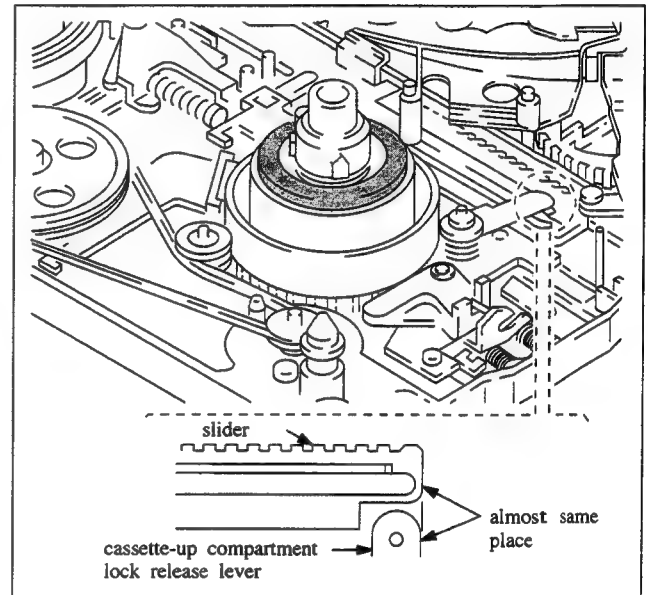
- (1) Rotate a manual gear using a philips type 2mm dia. screwdriver in the clockwise direction.
- (2) When a slider moves into the condition shown in the figure, stop rotating the screwdriver.



### 2. Unthreading end mode

Unthreading end mode is the same mode with EJECT completion and means that the threading ring rotates in the clockwise direction and stops.

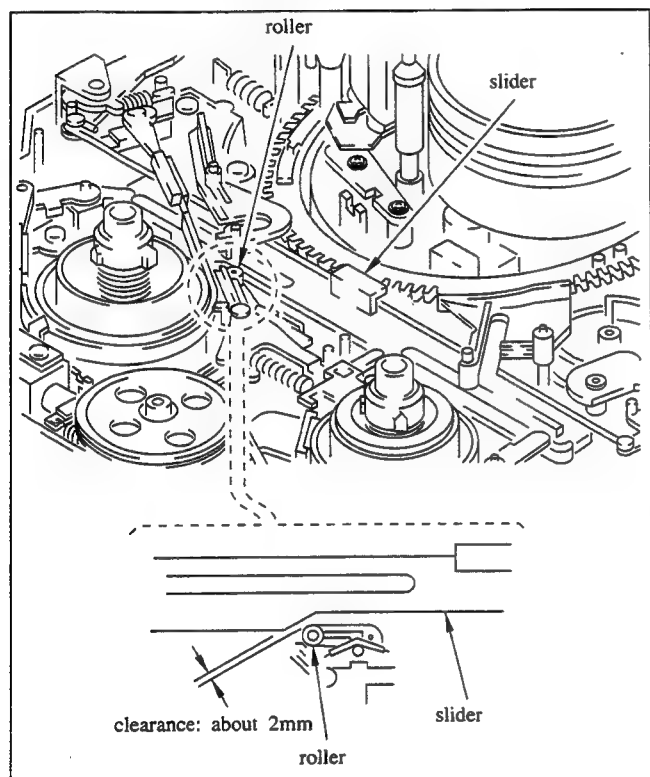
- (1) Rotate the manual using a philips type 2mm dia. screwdriver in the counter clockwise direction.
- (2) When the slider moves into the condition shown in the figure, stop rotating the screwdriver.



### 3. STOP/FF/REW mode

STOP/FF/REW mode is similar to the threading end mode in the aspect of mode, but the position of the slider is slightly different from the latter.

- (1) Rotate the manual gear using a philips type 2mm dia. screwdriver in the clockwise direction.
- (2) When the slider moves to the condition shown in the figure, stop rotating the screwdriver.

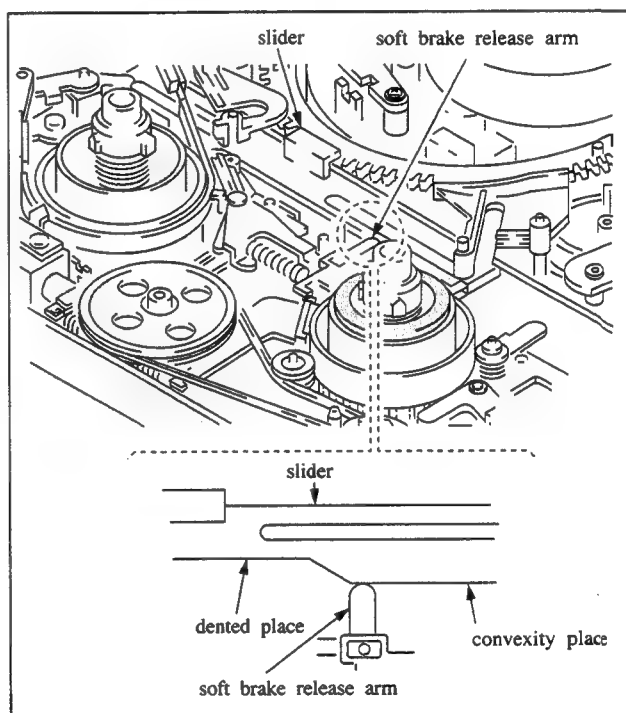


### 4. PLAY mode

PLAY mode means the mode where the pinch roller is pressed against the capstan shaft after STOP mode.

- (1) Rotate the manual gear using a philips type 2mm dia. screwdriver in the clockwise direction, and put into the STOP mode.
- (2) When the slider moves to the condition shown in the figure, stop rotating the screwdriver.

**NOTE:** Be sure not to rotate the gear further from this state, if rotate the gear further, the gear may be broken.





## 1-22. VOLTAGE CHANGE OF BATTERY BEFORE END

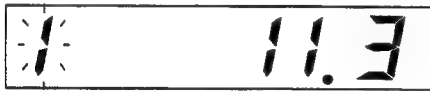
Voltage of battery before end can be changed by the following procedures.

Setting available range : 11.0 V to 13.0 V

Setting available minimum unit : 0.1V

When the unit is shipped, it is set to 11.3V.

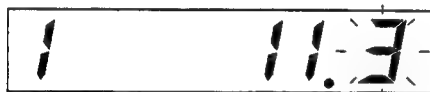
1. Press the [DIAGNOSTIC] switch on the side panel, and put into the DIAGNOSTIC mode.(Refer to section 1-9-2. Diagnostic mode)
2. Press the [ADVANCE] button on the side panel, and put into the MODE "1". Then, the voltage of battery before end is displayed on the LCD display.



3. Press the [SHIFT] button on the side panel, and the first digit blinks.



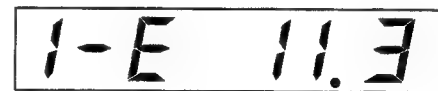
4. Press the [ADVANCE] button, and set the desired figure.
5. Press the [SHIFT] button, and the decimal digit blinks.



6. Press the [ADVANCE] button, and set the desired figure.
7. Press the [SHIFT] button. Then the desired voltage is stored in the ROM.  
If the value is stored in the ROM, "0" is displayed automatically.



If the value can not be stored in the ROM because of the error, the following message is displayed.



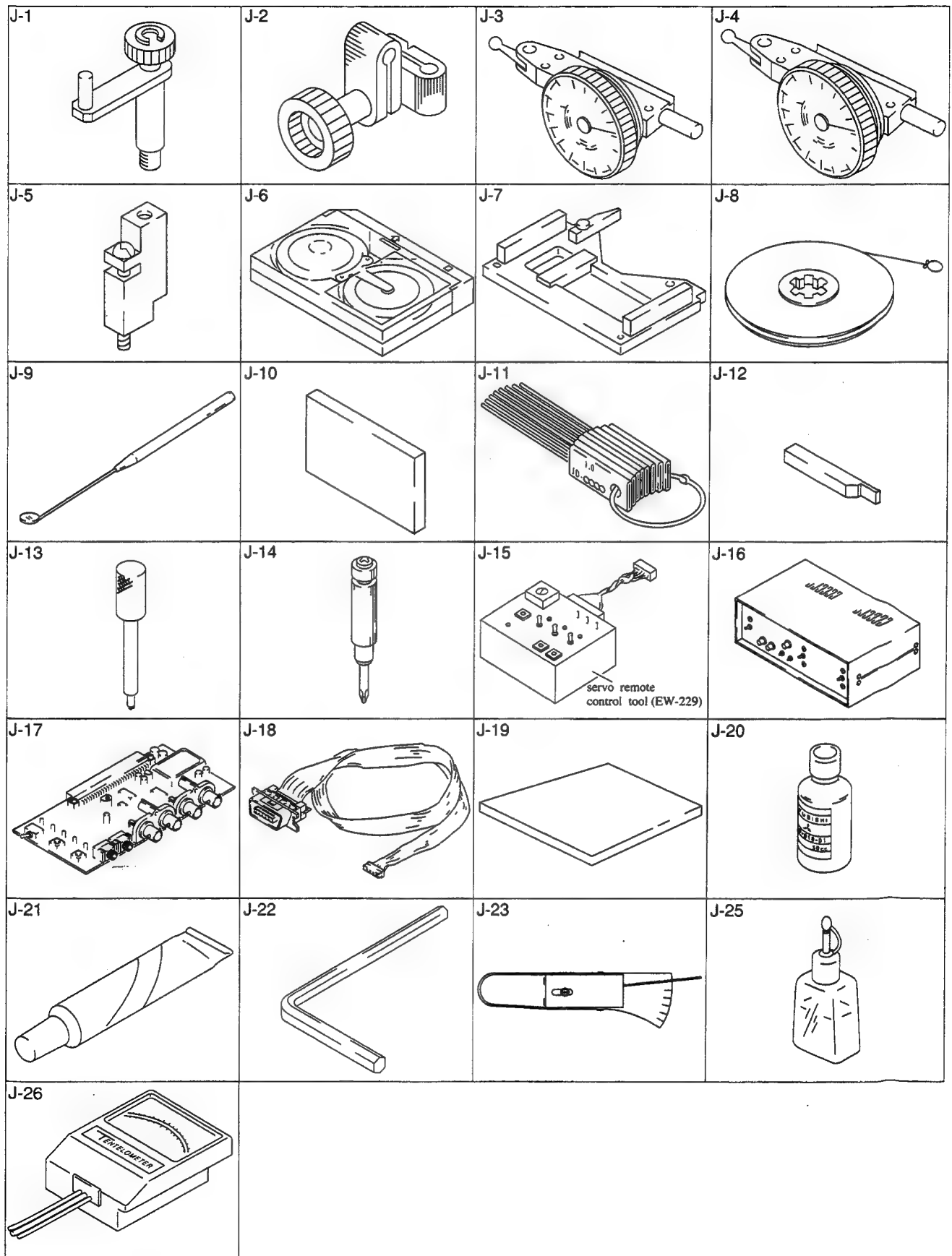
In this case, press the [ADVANCE] button, and then repeat the order of steps 2 through 7.

### 1-23. ALIGNMENT FIXTURE

Ref. No.	Part Number	Description	For Use
J-1	J-6001-820-A	Drum eccentricity gauge(3)	Upper drum eccentricity adjustment
J-2	J-6001-830-A	Drum eccentricity gauge(2)	
J-3	J-6001-840-B	Drum eccentricity gauge(1)	
J-4	or J-6325-530-A	Drum eccentricity gauge(6)	
J-5	J-6087-000-A	Drum eccentricity gauge(5)	
J-6	J-6080-003-C	Cassette Torque Measurement	Torque adjustment
J-7	J-6080-008-A	Cassette reference plate	Reel table adjustment
J-8	J-6080-011-A	Plate Reel, Tension gauge	Torque adjustment
J-9	J-6080-029-A	Inspection Mirror	Tape path adjustment
J-10	J-6086-570-A	Flatness plate	Audio/TC head zenith adjustment
J-11	J-6152-450-A	Wire Clearance gauge	Clearance check
J-12	J-6190-800-A	Tension Regulator Vertical Check tool	Tension regulator slatness adjustment
J-13	J-6321-040-A	Screwdriver for Motor pulley	Motor pulley replacement
J-14	J-6321-500-A	Tape guide adjustment driver	Tape guide height adjustment
J-15	J-6332-290-A	Servo remote control tool (EW-229)	Servo system adjustment
J-16	J-6335-790-A	Deviation Checker	Deviation adjustment
J-17	J-6337-830-A	Camera Tool (EW-783)	Component video system adjustment
J-18	J-6338-040-A	Cable (EW-804)	Connection cable connected Servo remote control tool with PVV-1P
J-19	2-034-697-00	Cleaning piece	Cleaning
J-20	7-661-018-18	Oil	Lubrication
J-21	7-662-010-04	Grease	
J-22	7-700-736-05	Wrench, L-Shaped 1.5mm	Tightening screw
	7-700-736-06	Wrench, L-Shaped 0.89mm	
J-23	7-732-050-30	Tension scale(100g full scale)	Torque/Back tension adjustment
	7-732-050-40	Tension scale(200g full scale)	Torque/Back tension adjustment
J-24	8-960-096-51	Alignment tape, CR2-1B PS	Video tracking adjustment
	8-960-096-91	Alignment tape, CR5-1B PS	Video tracking adjustment
	8-960-098-45	Alignment tape, CR8-1A PS	Audio alignment
	8-960-096-86	Alignment tape, CR8-1B PS	Audio alignment
	8-960-098-44	Alignment tape, CR5-2A PS	Video system, servo system adjustment
J-25	9-919-573-01	Cleaning fluid	Cleaning
J-26	TENELOMETER (T2-H7-UMC) : recommended tool		

**NOTE:** TENEL Corp.  
1506 Dell Ave. Campbell, CA 95008

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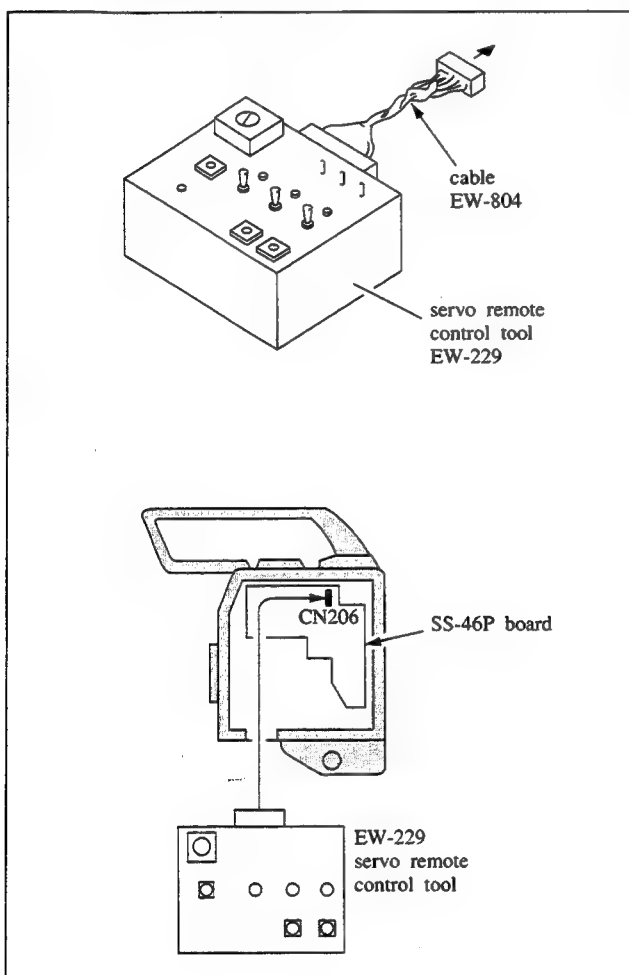
## 1-24. USE OF THE SERVO REMOTE CONTROL TOOL (EW-229)

For servo system alignment and mechanical alignment, it is recommended to use the SERVO REMOTE CONTROL TOOL (EW-229).

By using this tool, the mode that are not available in this unit can be obtained.

### 1. Connection

- (1) Connect the connector (14P, female) of the supplied harness to the tool.
- (2) Connect the other side of the connector of the harness to CN206/SS-46P board of the VTR.



### 2. Mode Selection

The desired mode can be selected by pressing the switches and rotary switch on the function control panel of this tool.

#### • TRCON Switch

After the rotary switch is set to the "F" position, turn ON this switch. Then LED lights. Tracking control is possible by pressing the "+" button or the "-" button.

When turned OFF, return the unit to the just tracking mode. The memory is cleared by disconnecting the connector of the tool from the CN206/SS-46P board.

#### • SW POSITION Switch

After the rotary switch is set to the "F" position, turn ON this switch. Then LED lights, the switching position is shifted by pressing the "+" button or the "-" button.

#### • REC SERVO Switch

After the rotary switch is set to the "F" position, turn ON the switch. Then LED lights, and the capstan servo circuit is put into the REC SERVO mode.

#### • REV Button

The unit is put into REV mode by pressing this button. Press the [STOP] button on the VTR, and the unit is put into the STOP mode.

#### • Rotary Switch

The mode described in the following mode table is obtained by setting the rotary switch to "0" through "F" positions. When the rotary switch is set to the specified position, it is necessary to mute the slack detection circuit.

The slack detection circuit can be muted by turning ON the S5/SS-46P board.

#### • SW PULSE Test Point

The switching pulse signal is appeared at this test terminal. When mode is "0" through "3", SW PULSE of selected head is appeared.

#### • CTL Test Point

The CTL signal is appeared at this test terminal.

Mode table

Rotary Switch	Mode	For Use
0	CH-A SW PULSE of Y is selected	Check CH-A head of Y.
1	CH-B SW PULSE of Y is selected	Check CH-B head of Y.
2	CH-A SW PULSE of C is selected	Check CH-A head of C.
3	CH-B SW PULSE of C is selected	Check CH-B head of C.
4	PAUSE mode	Put the capstan into the stop servo mode, it enable to keep RF on wave-shaped of counter. Check the capstan stop servo adjustment.
5		
6		
7	Drum rotating stops. (Mute the slack detection circuit.)	Turn four head ON, and stop drum rotating to check REC current of drum head.
8	Capstan x 1/2 times speed mode	Confirm the servo system
9	Capstan x 1/6 times speed mode	Confirm the servo system
A		
B		
C	Capstan FG DUTY adjustment mode	Rotate the capstan to adjust the capstan FG DUTY.
D	Capstan free speed adjustment mode	Measuring adjustment instruction is appeared to check capstan free speed.
E		
F	Normal mode	

## 1-25. USE OF CAMERA TOOL (EW-783)

Camera tool has terminals of every kind component video signal input, play back video signal output, mic signal input and earphone output. This also has VTR S/S switch, REC REVIEW switch, SAVE → STBY switch and every kind of LED DISPLAY system.

When every kind component video signal is input during video system alignment, and when VTR is connected as follows to check with no camera during PVV-1P maintenance, use the camera tool.

### 1. Switch operation

#### VTR S/S Switch

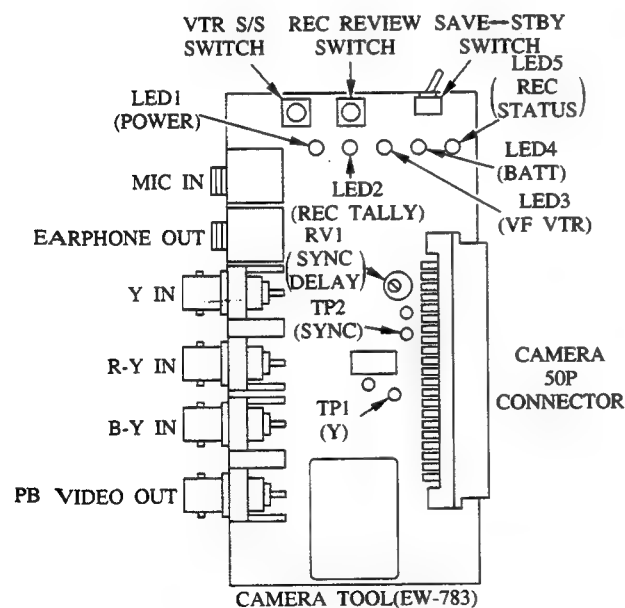
This switch is VTR record start/stop switch. When this switch is pressed, recording starts. When this switch is pressed again, recording stops.

#### REC REVIEW Switch

When this switch is pressed, part of recorded portion plays back. Confirm recording display in PB VIDEO OUT display during waiting to record.

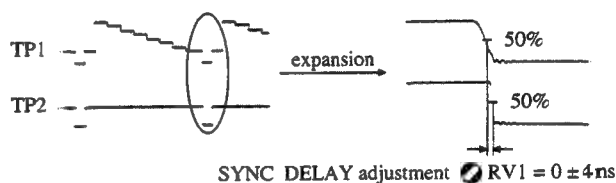
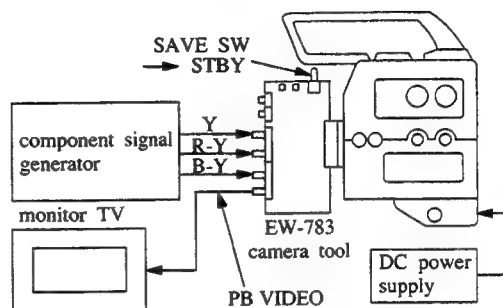
#### SAVE → STBY Switch

- SAVE  
VTR is in power-saving condition.
- STBY  
VTR is waiting to record. Press [VTR S/S] switch, and recording starts at once.



## 2. Camera Tool Connection and Alignment

When electrical alignments are performed with the camera tool, never fail to perform SYNC DELAY alignment connecting the camera tool as follows.



## 1-26. SET-UP CHECK SHEET

It is recommended to use this set-up check sheet to write down the set-up conditions (switch setting, control volume setting, etc...) before performing maintenance, or to memorize the set-up conditions after installation.

<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 150px; height: 40px; margin-bottom: 10px;"></div> <div style="width: 80px; height: 80px; border: 1px solid black; border-radius: 50%;"></div> <div style="width: 80px; height: 80px; border: 1px solid black; border-radius: 50%;"></div> </div> <div style="display: flex; justify-content: space-around; font-size: 0.8em;"> <div style="text-align: center;"> <input type="checkbox"/> <b>DISPLAY</b> TC CTL <input type="checkbox"/> U-BIT         </div> <div style="text-align: center;"> <input type="checkbox"/> <b>LIGHT</b> OFF <input type="checkbox"/> ON         </div> <div style="text-align: center;"> <b>AUDIO SELECT</b>            MAN <input type="checkbox"/> AUTO    MAN <input type="checkbox"/> AUTO         </div> </div>			
<div style="width: 60px; height: 60px; border: 1px solid black; border-radius: 50%; margin: 0 auto;"></div> <b>MONITOR</b>	<div style="width: 60px; height: 60px; border: 1px solid black; border-radius: 50%; margin: 0 auto;"></div> <b>ALARM</b>	<b>MONITOR SELECT</b> CH-1 MIX CH-2 <div style="display: flex; justify-content: center; gap: 10px;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div>	
		<b>AUDIO LEVEL</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="width: 60px; height: 60px; border: 1px solid black; border-radius: 50%; margin: 0 auto;"></div> <div style="width: 60px; height: 60px; border: 1px solid black; border-radius: 50%; margin: 0 auto;"></div> </div> <div style="display: flex; justify-content: space-around; font-size: 0.8em;"> <span>CH-1</span> <span>CH-2</span> </div>	
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 20%; text-align: center;"> <input type="checkbox"/>   <div style="border: 1px solid black; width: 60px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <input type="checkbox"/> </div> </div> <div style="width: 60%; padding: 0 10px;"> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <input type="checkbox"/> <b>PRESET</b>  <input type="checkbox"/> F-RUN  <input type="checkbox"/> SET  <input type="checkbox"/> REGEN R-RUN           </div> <div style="text-align: center;"> <input type="checkbox"/> <b>AUDIO IN</b>  <div style="display: flex; flex-direction: column; gap: 5px;"> <input type="checkbox"/> CAM  <input type="checkbox"/> MIC  <input type="checkbox"/> LINE           </div> </div> <div style="text-align: center;"> <input type="checkbox"/> CH-1  <input type="checkbox"/> CH-2           </div> </div> </div> </div>			

<b>+48v CH-1</b> OFF <input type="checkbox"/> ON <input type="checkbox"/>	<b>+48v CH-2</b> OFF <input type="checkbox"/> ON <input type="checkbox"/>
<div style="border: 1px solid black; width: 120px; height: 80px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="width: 60px; height: 60px; border: 1px solid black; border-radius: 50%;"></div> </div>	<div style="border: 1px solid black; width: 150px; height: 80px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="width: 60px; height: 60px; border: 1px solid black; border-radius: 50%;"></div> <div style="width: 60px; height: 60px; border: 1px solid black; border-radius: 50%;"></div> </div>





## **SECTION 2**

### **PERIODIC CHECK AND MAINTENANCE**

#### **2-1. PERIODIC CHECK AND MAINTENANCE**

It is recommended that the periodic check and maintenance schedule be employed in order to obtain maximum performance and longer tape life from the PVV-1. (Refer to Section 2-6.)

#### **2-2. HOURS METER**

The operation time of the unit is displayed in the LCD display or the monitor screen which is connected to ENCODE VIDEO OUT connector on the side panel.

##### **Operation procedure:**

Press the [DIAGNOSTIC] switch on the side panel with a pencil lead or similar object, and put into the DIAGNOSTIC mode. Then the HOURS METER of MODE [0] is displayed on the LCD display, and/or [HOURS METER DISPLAY] is displayed on the monitor screen.

The HOURS METER display has three functions.

- (1) A. DRUM RUNNING  
Displays accumulated rotation time of the drum.
- (2) B. TAPE RUNNING  
Displays accumulated tape running time.
- (3) C. OPERATION  
Displays accumulated time that the POWER has been turned ON.

These three functions can select by pressing the [SHIFT] button on the side panel.

It is recommended that the HOURS METER is used as a tool for determining the periodic check.

### 2-3. MAINTENANCE AFTER THE REPAIRS

Perform the following maintenance after repair without regarding the machine operating hours.

1. Video heads and stationary heads cleaning.  
(Refer to Section 2-4-1.)
2. Tape movement area cleaning.  
(Refer to Section 2-4-4.)

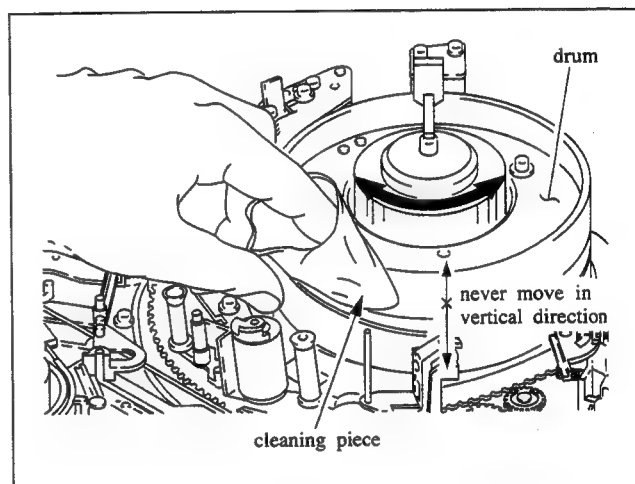
### 2-4. CLEANING PROCEDURE

Cleaning procedure is as follows. Be sure not to insert a cassette tape before the cleaning fluid evaporates completely.

#### 2-4-1. Video Head

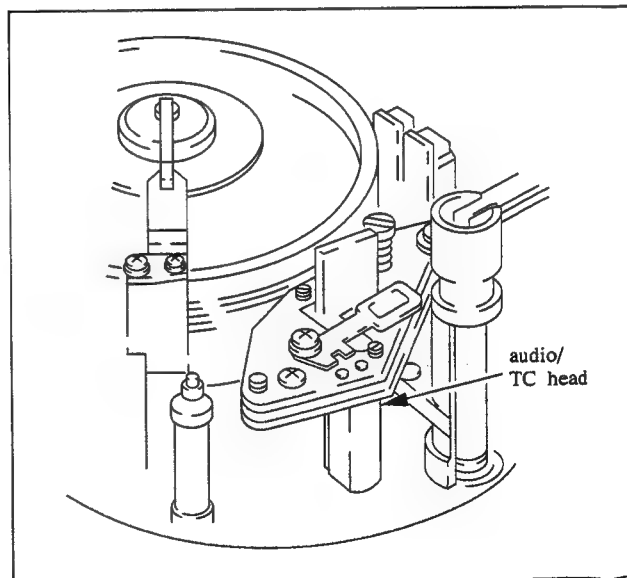
Press a cleaning piece moistened with cleaning fluid and turn the drum slowly with hand.

- (NOTE)**
1. Never move the cleaning piece in the vertical direction of the head tip when cleaning.
  2. Perform the cleaning with the POWER OFF.



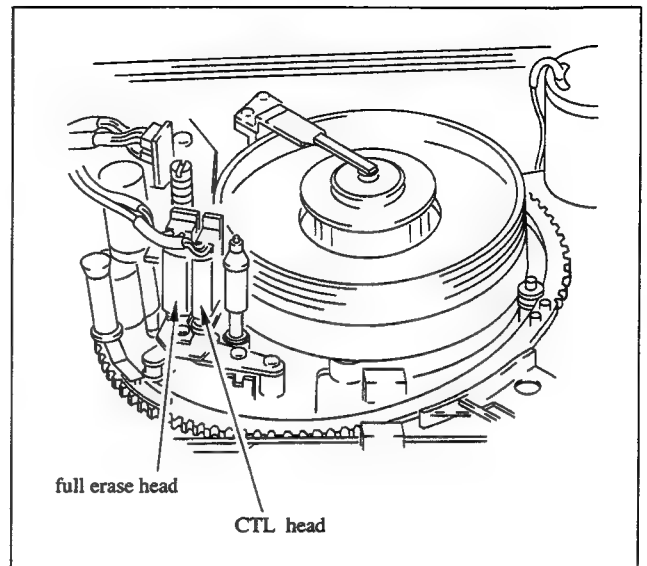
#### 2-4-2. Audio/TC Heads

Clean with a cleaning piece moistened with cleaning fluid.



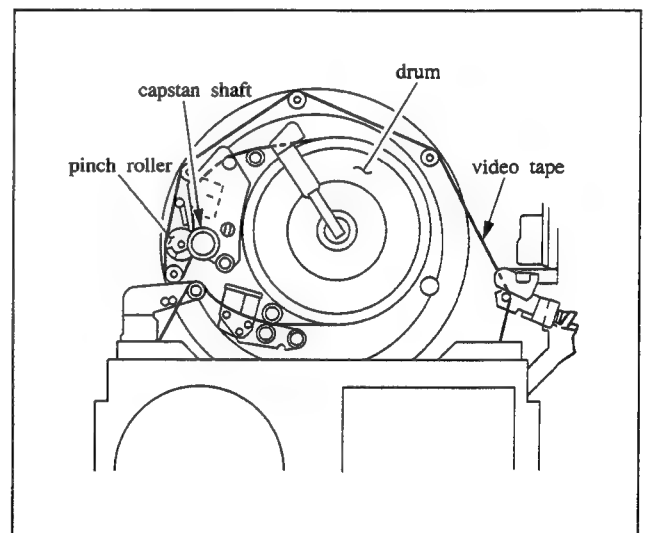
#### 2-4-3. CTL, FE (Full Erase) Heads

Clean with a cleaning piece moistened with cleaning fluid.



#### 2-4-4. Tape Movement Areas

Clean with a cleaning piece moistened with cleaning fluid, tape guides, drum, capstan and the pinch roller as shown in the figure.



## 2-5. AFTER EXPOSE TO SAND OR DUST

It is recommended to check the following items after the PVV-1 is exposed to sand or dust.

- (1) Clean off the sand or dust in the PVV-1 with a cleaning piece moistened with cleaning fluid, or carefully blow it off with an air-brush.
- (2) Clean the video head and stationary heads with a cleaning piece moistened with cleaning fluid.
- (3) Clean the tape movement areas (the drum surface, tape guides, capstan shaft and the pinch roller) with a cleaning piece moistened with cleaning fluid.
- (4) Clean the belts located on both sides of chassis.
- (5) Clean the surface of the reel tables contact with the brake shoes.
- (6) Rotate the tape guides, pulley, capstan and the pinch roller by hand, and check for any abnormal noise. If there are any abnormal noises, replace the part immediately.
- (7) After the PVV-1 is used at seaside, remove the printed circuit board. Clean the printed circuit board with a cleaning piece moistened with cleaning fluid after blow off sand on the completely. Clean the soldering side in the same manners.
- (8) Clean the connector on the connector panel completely. (Disconnect and clean each pin.)
- (9) Perform the operation check and be sure that the machine operates normally.

2-6. PERIODIC MAINTENANCE TABLE

It is recommended to perform the periodic maintenance in order to obtain correct function and higher performance, and also to extend the life of tape and unit.  
It is recommended to perform the periodic check and maintenance referring to "A. DRUM RUNNING" shown in HOURS METER display.

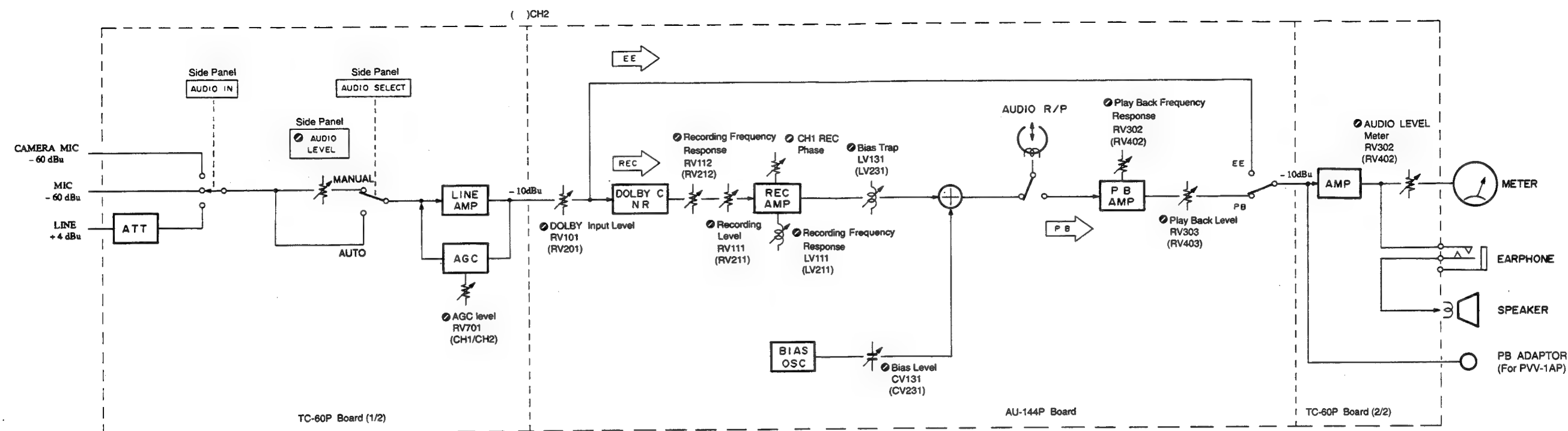
○mark: Execute  
△mark: confirm, if not, replace or adjust

Item	500H	1000H	1500H	2000H	2500H	3000H	Replacement Part	Q'ty	Remarks
Tape running system									
Tape running surface cleaning	○	○	○	○	○	○			
Tape running confirmation/adjustment	△	△	△	△	△	△			
Upper drum assembly replacement	○	○	—	○	○	—	PVV-1P; A-6762-455-A UPPER DRUM ASSY, DBR-23-R PVV-1AP; A-8267-140-A UPPER DRUM ASSY, DBR-38-R	1pc	(Note 1)
Drum assembly replacement	—	—	○	—	—	○	PVV-1P; A-6050-833-A DRUM ASSY, DBH-23A-R PVV-1AP; A-8260-607-A DRUM ASSY, DBH-38A	1pc	
Video tracking confirmation/adjustment	△	△	△	△	△	△			
Tension regulator band replacement	○	○	○	○	○	○	X-3717-736-1 BAND ASSY, T	1pc	
S soft brake shoe replacement	○	○	○	○	○	○	X-3166-112-3 BRAKE ASSY, S SOFT	1pc	
T soft brake shoe replacement	○	○	○	○	○	○	X-3166-113-1 BRAKE ASSY, T SOFT	1pc	
S brake shoe replacement	○	○	○	○	○	○	X-3717-734-5 BRAKE ASSY, MAIN S (FOR PVV-1P; S/N 10001 through 10800) X-3166-577-1 BRAKE ASSY, MAIN S (FOR PVV-1P; S/N 10801 and higher) (FOR PVV-1AP)	1pc 1pc 1pc 1pc	
T brake shoe replacement	○	○	○	○	○	○	X-3717-735-4 BRAKE ASSY, MAIN T	1pc	
Tape guide wearing confirmation/adjustment	—	—	△	—	—	△	A-6746-023-E GUIDE ASSY, ENTRANCE A-6746-024-E GUIDE ASSY, EXIT X-3675-851-0 ROLLER ASSY, T R 3-717-923-01 GUIDE, DUMMY	1pc 1pc 1pc 1pc	
Tape guide flange wearing confirmation /adjustment	—	—	△	—	—	△	X-3617-703-2 LIND ASSY, SLANT 3-677-752-00 NUT, ADJUSTMENT, T 3-717-859-01 FLANGE, TR (LOWER)	1pc 1pc 1pc	
AUDIO/TC head replacement	—	—	○	—	—	○	8-825-776-11 HEAD, AU PS244-2103D	1pc	
CTL head replacement	—	—	○	—	—	○	8-825-554-83 HEAD, CTL PS244-21B	1pc	
Full erase head replacement	—	—	○	—	—	○	8-825-770-72 HEAD, FE EF291-21	1pc	
Drive system									
Pinch roller replacement	○	○	○	○	○	○	X-3166-107-2 ARM ASSY, PINCH	1pc	
Reel belt replacement	○	○	○	○	○	○	3-717-908-01 BELT, REEL	1pc	
Drum belt replacement	○	○	○	○	○	○	3-717-910-01 BELT, DRUM	1pc	
Ground shaft replacement	—	○	—	○	—	○	X-3166-357-1 GROUND ASSY, SHAFT	1pc	
Idler replacement	—	○	—	○	—	○	X-3166-116-1 IDLER SUB ASSY	1pc	
Pinch solenoid replacement	—	—	○	—	—	○	1-454-445-21 SOLENOID	1pc	
Brake solenoid replacement	—	—	○	—	—	○	1-454-382-31 SOLENOID	1pc	
Reel motor replacement	—	—	○	—	—	○	8-835-461-01 MOTOR, DC LN22-M16Z1B	1pc	
Drum motor replacement	—	—	○	—	—	○	A-8267-147-A MOTOR ASSY, DRUM	1pc	
Capstan motor replacement	—	—	○	—	—	○	8-835-437-01 MOTOR, DC SCV-0201A	1pc	
Threading motor replacement	—	—	○	—	—	○	8-835-462-01 MOTOR, DC DN20-Q7Z2B	1pc	
Gear box replacement	—	—	—	—	—	○	A-6750-297-A GEAR BLOCK ASSY	1pc	

Note 1: The video head life is greatly affected by operating ambient condition and tape.

Item	500H	1000H	1500H	2000H	2500H	3000H	Replacement Part	Q'ty	Remarks
Mechanical operation confirmation									
Abnormal noise	△	△	△	△	△	△			
S soft brake operation confirmation	△	△	△	△	△	△			
T soft brake operation confirmation	△	△	△	△	△	△			
S main brake torque confirmation	△	△	△	△	△	△			
T main brake torque confirmation	△	△	△	△	△	△			
FWD torque adjustment	△	△	△	△	△	△			
FWD back tension adjustment	△	△	△	△	△	△			
Electrical confirmation									
System control operation confirmation	△	△	△	△	△	△			
Servo system operation confirmation/adjustment	△	△	△	△	△	△			
Audio specifications confirmation	△	△	△	△	△	△			
Video specifications confirmation	△	△	△	△	△	△			

## [Audio System Adjustment Block Diagram]



## [Outline of Audio System Adjustment]

- Audio reference input level  
MIC input = -60 dBu  
(0 dBu = 0.775 Vrms)  
Decrease by attenuator in LINE input.

- AUDIO LEVEL (Manual operation)**
  - Adjusts the reference input level of Audio System Adjustment.
  - Never move this level until Audio System Adjustment is completed.

- AGC Level (Auto operation)**
  - When a level of input signal is too large, AGC circuit controls the level to specified value automatically.
  - This adjusts this specified value.

- DOLBY Input Level**
  - Adjusts input level to Dolby C noise reduction encoder circuit.

- Recording Level**
  - Adjust a level which is to be recorded on a tape. This unit only have a simple play back function, so adjust the level to specified level by playing back with a standard play back machine.

- Recording Frequency Response**
  - Adjusts frequency response recorded on a tape. Adjust to specified frequency response by playing back with a standard play back machine.
  - Recording level also changes a little.

- Bias Trap**
  - Adjusts to minimize a leak value of bias signal to REC AMP.
  - Adjust with Bias Level at the same time.

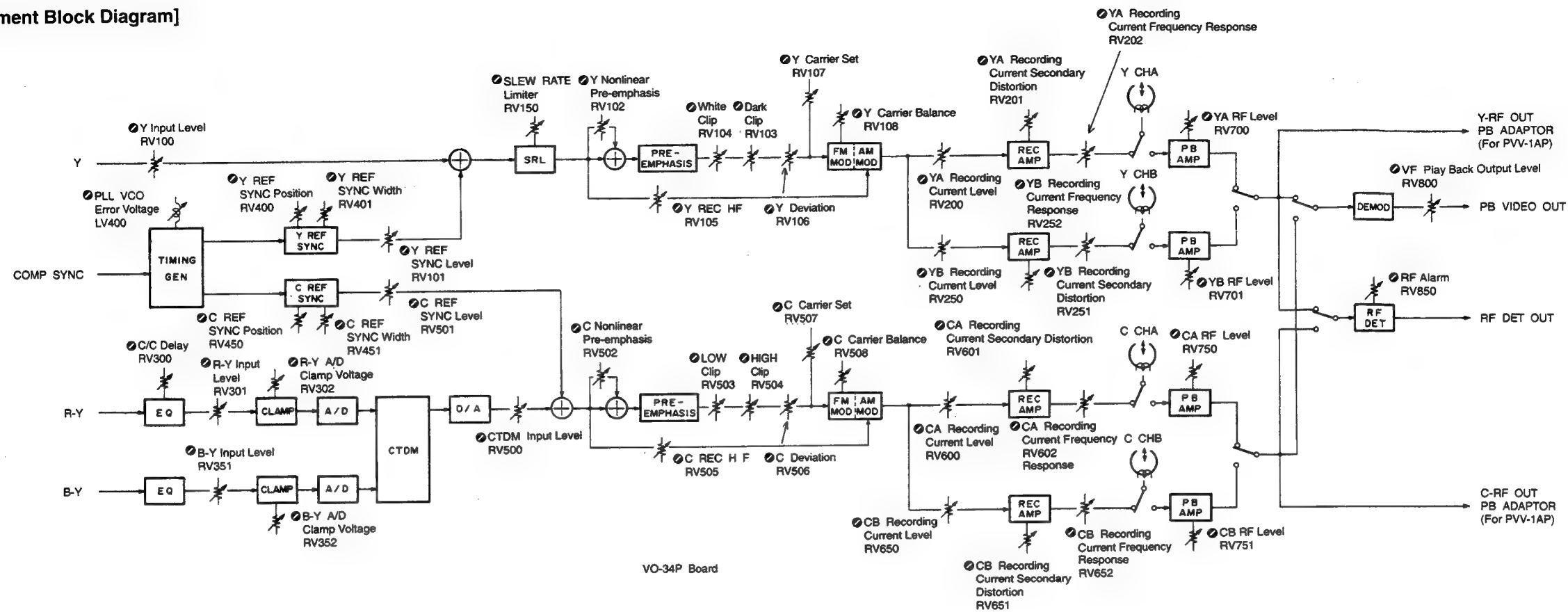
- Bias Level**
  - Adjusts bias signal level that is mixed with recording audio signal.
  - Adjust with Bias Trap at the same time.
  - Recording frequency response and recording level also change.

- Play Back Frequency Response**
  - Adjusts play back frequency response by playing back an alignment tape.
  - Play back level also changes a little.

- Play Back Level**
  - Adjust play back level to specified value by playing back an alignment tape.
  - Before this adjustment, adjust Play Back Frequency Response.

- AUDIO LEVEL Meter**
  - Connects reference input signal, and adjusts indication of level meter to 0VU.

## [Video System Adjustment Block Diagram]



## [Outline of Video System Adjustment]

### Y Input Level

- Adjusts Y signal input level.

### R-Y Input Level, B-Y Input Level

- Adjusts A/D converter input level.

### R-Y A/D Clamp Voltage B-Y A/D Clamp Voltage

- Adjusts A/D converter input dc bias voltage.

### C/C Delay

- Adjusts phase of R-Y signal and B-Y signal.
- Records Bowtie signal, and measure C/C delay value by playing back with a standard play back machine.

### CTDM Input Level

- Adjusts CTDM signal input level.

### PLL VCO Error Voltage

- Adjusts voltage to phase lock VCO of timing generator to COMP SYNC.

### Y REF SYNC Position, Width, Level

- As for a phase information of Y signal during recording, Y REF SYNC is inserted. Adjusts this REF SYNC pulse position, width and level.
- Y REF SYNC position is adjusted as a video phase adjustment. Records Bowtie signal, and play it back with a standard play back machine, and measure video phase, then adjust.

### C REF SYNC Position, Width, Level

- As for a phase information of R-Y/B-Y signals during recording, C REF SYNC is inserted. Adjusts this REF SYNC pulse position, width and level.
- C REF SYNC position is adjusted as a Y/C delay adjustment. Records Bowtie signal, and play it back with a standard play back machine, and measure Y/C delay value, then adjust.

### SLEW RATE Limiter

- Adjusts for over-modulation compensate circuit during recording that is to limit the steep signal at rising-up edge of too large amplitude and too high frequency signal of Y signal.

### Y Nonlinear Pre-emphasis C Nonlinear Pre-emphasis

- Adjusts for compensate circuit that improves play back picture quality in details portion during playing back by pre-emphasize the high frequency signal component.

### White Clip, Dark Clip

- After pre-emphasized, controls the over shooting and under shooting levels of signal, and adjusts to control an excessive frequency deviation after frequency modulation.
- White clip controls over shooting. Dark clip controls under shooting.

### Low Clip, High Clip

- After pre-emphasized, controls the over shooting and under shooting levels of signal, and adjusts to control an excessive frequency deviation after frequency modulation.
- Low clip controls under shooting.
- High clip controls over shooting.

### Y REC HF, C REC HF

- By extracting the signal where amplitude is too large and frequency is too high, and amplified FM signal of this signal by AM modulator, and then to record it. This compensates over modulation during play back. Adjusts slice level of this compensate circuit.

### Y Carrier Set, Y Deviation

- Adjusts pedestal frequency and frequency deviation (a difference between sync tip frequency and white peak frequency) of Y-FM signal.
- Y Carrier set adjusts the pedestal frequency to 7.4MHz.
- Y deviation adjusts the frequency deviation to 2.0 MHz

### C Carrier Set, C Deviation

- Adjusts pedestal frequency and frequency deviation (a difference between Low level frequency and High level frequency) of C-FM signal.
- C Carrier set adjusts the pedestal frequency to 6.1MHz.
- C deviation adjusts the frequency deviation to 1MHz.

### Y Carrier Balance, C Carrier Balance

- Adjusts to minimize the level of secondary distortion of FM Carrier.

### YA•YB Recording Current Level, Secondary Distortion, Frequency Response

- Adjusts play back RF signal level by playing back an alignment tape.
- Recording current is adjusted to match the characteristics of video heads on an upper drum, be sure to adjust it when upper drum is replaced.
- When adjustment is out of specification, over-modulation may be appeared.

### YA•YB RF Level, CA•CB RF Level

- Adjusts play back RF signal level by playing back an alignment tape.

### VF Play Back Output Level

- Adjusts play back output video signal level for view finder by playing back an alignment tape.

### RF Alarm

- Adjusts sensitivity of RF alarm detect circuit in REC pause mode.



## SECTION 3

### MAJOR PART REPLACEMENT AND ALIGNMENT

#### 3-1. GENERAL INFORMATION FOR PART REPLACEMENT

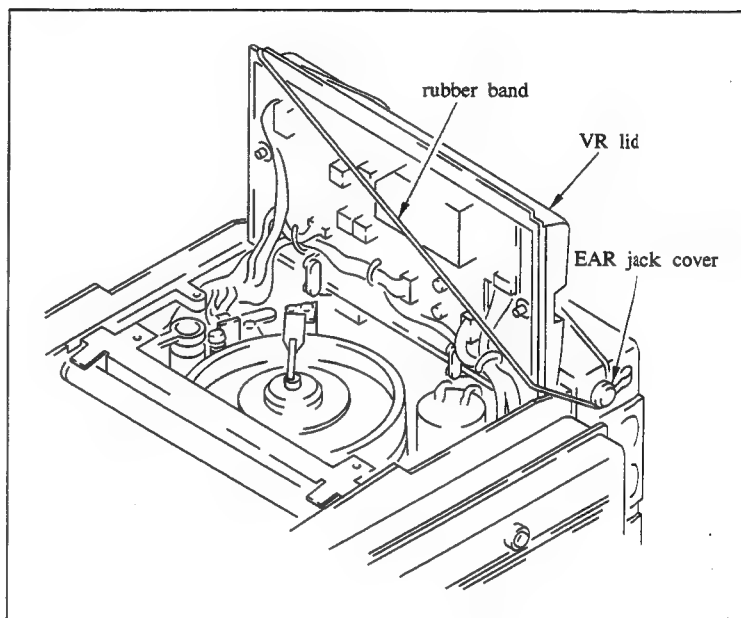
1. When replacing part on the upper portion of the unit.

##### **Preparations before replacement:**

Before replacing part, perform the following procedures:

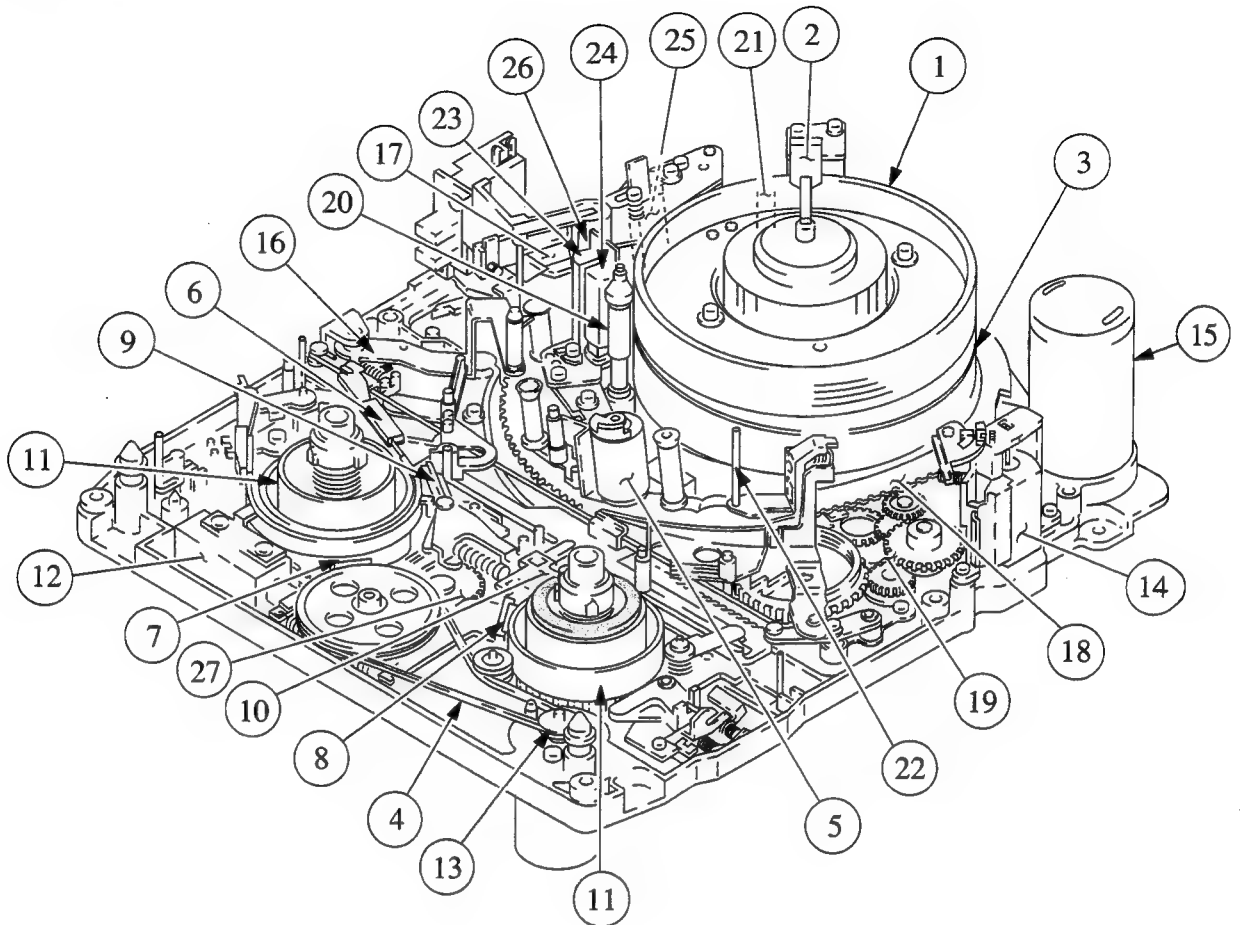
- (1) Turn the POWER switch OFF.
- (2) Remove a cassette-up compartment lid.  
(Refer to Section 1-12.)
- (3) Open a VR lid. (Refer to Section 1-12.)  
It is easier if the lid is fixed with a rubber band as shown in the figure to prevent the VR lid from closing while part replacement and adjustment work is in progress.
- (4) Remove a cassette-up compartment.

**Note:** The above item is omitted in the respective replacement sections.



NO.	PART NAME	REPLACEMENT ITEM NAME	PAGE
1.	Upper drum assembly	3-2. Upper drum assembly replacement	3-13
2.	Ground shaft	3-3. Ground shaft assembly replacement	3-18
3.	Drum assembly	3-4. Drum assembly replacement	3-19
4.	Reel belt	3-5. Reel belt replacement	3-23
5.	Pinch roller	3-7. Pinch roller replacement	3-26
6.	Tension regulator band	3-8. Tension regulator band replacement	3-30
7.	S brake shoe	3-9. S brake shoe replacement	3-38
8.	T brake shoe	3-10. T brake shoe replacement	3-41
9.	S Soft brake shoe	3-11. S soft brake shoe replacement	3-44
10.	T soft brake shoe	3-12. T soft brake shoe replacement	3-48
11.	S/T reel table	3-13. Supply reel table replacement	3-51
		3-14. Take-up reel table replacement	3-53
12.	Brake solenoid	3-15. Brake solenoid replacement	3-55
13.	Reel motor/reel motor pulley	3-16. Reel motor replacement	3-59
14.	Threading motor/threading motor pulley	3-17. Threading motor replacement	3-61
15.	Drum motor/drum motor pulley	3-18. Drum motor replacement	3-63
16.	Tension regulator	3-19. Tension regulator block replacement	3-66
17.	Pinch press block / pinch solenoid	3-20. Pinch press block replacement	3-70
18.	Threading ring	3-21. Threading ring replacement	3-75
19.	Gear block	3-22. Gear block replacement	3-79
20.	TG-I tape guide	3-23. TG-I tape guide replacement	3-83
21.	TG-II tape guide	3-24. TG-II tape guide replacement	3-85
22.	Slantness guide	3-25. Slantness guide assembly replacement	3-86
23.	Full erase head	3-26. Full erase head replacement	3-87
24.	CTL head	3-27. CTL head replacement	3-89
25.	AUDIO/TC head	3-28. AUDIO/TC head replacement	3-91
26.	Capstan motor	3-29. Capstan motor replacement	3-93
27.	Idler pulley assembly	3-30. Idler pulley assembly replacement	3-95

< Top View >



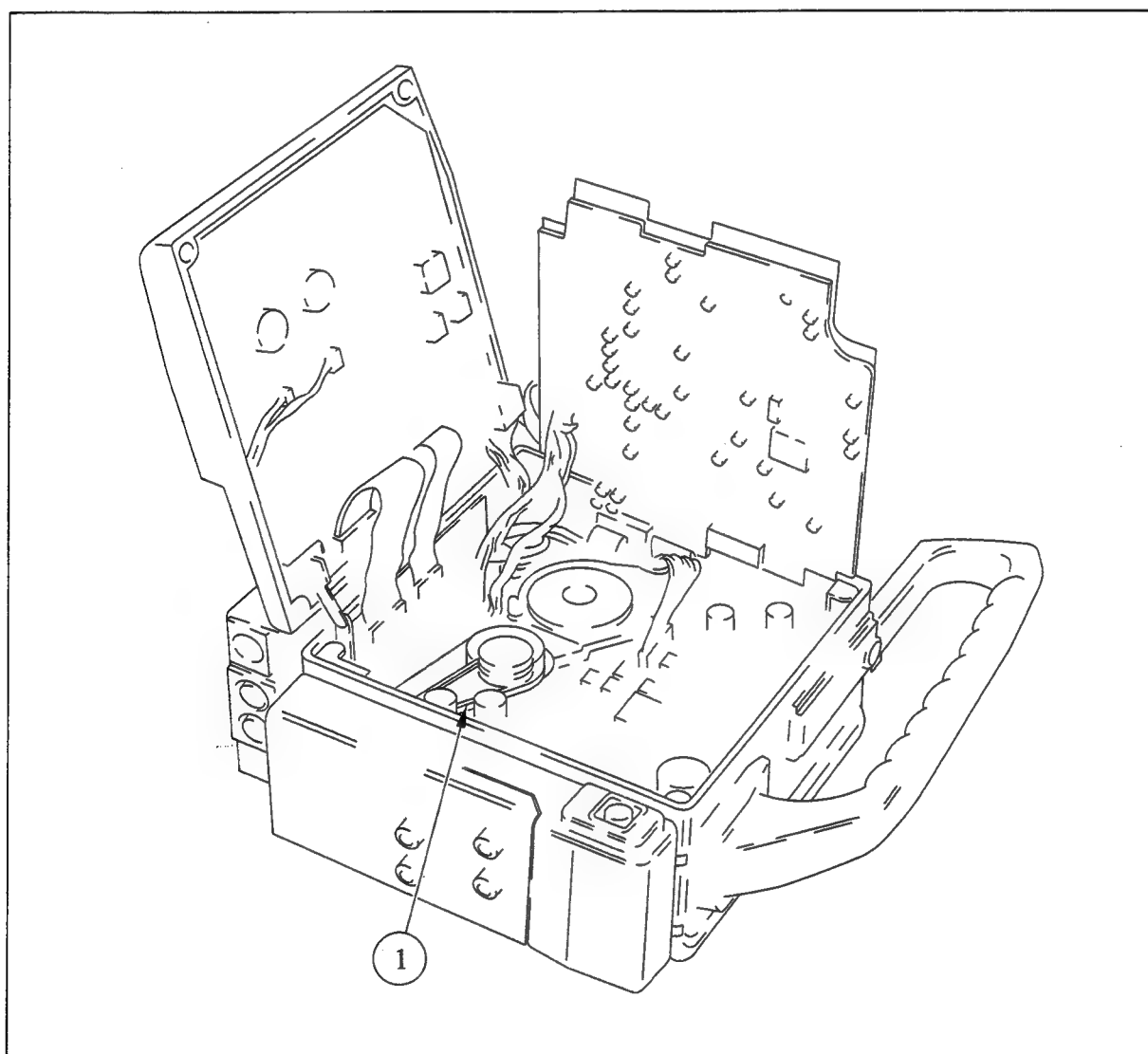
2. When replacing part on the back side portion of the unit.

**Preparations before replacement:**

Before replacing part, perform the following procedures:

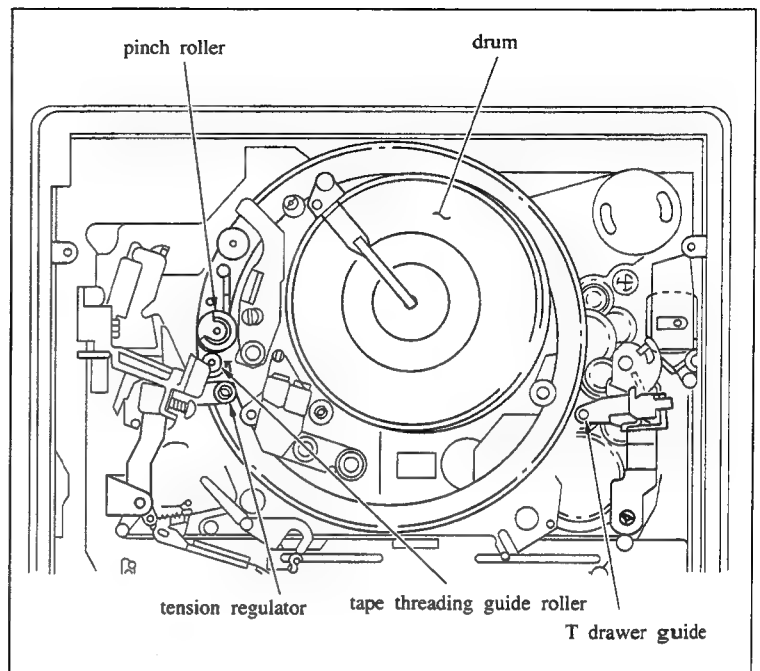
- (1) Turn the POWER switch OFF.
- (2) Open a side panel. (Refer to Section 1-12.)
- (3) Open VO-34P board. (Refer to Section 1-13.)

NO.	PART NAME	REPLACEMENT ITEM NAME	PAGE
1.	Drum belt	3-6. Drum belt replacement	3-24

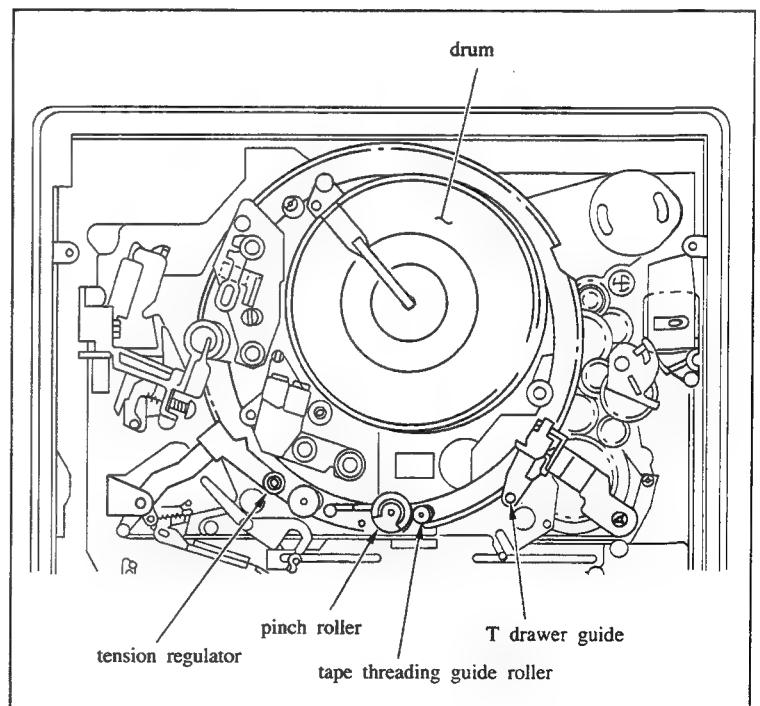


### 3. Threading end mode / Unthreading end mode

Threading end mode means that the threading ring rotates in the counterclockwise direction and stops.



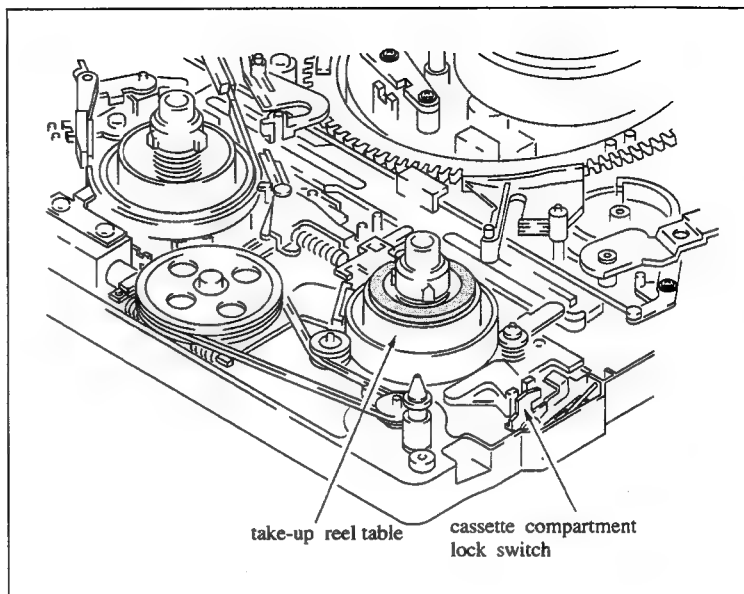
Unthreading end mode is the same condition with EJECT completion and means that the threading ring rotates in the clockwise direction and stops.



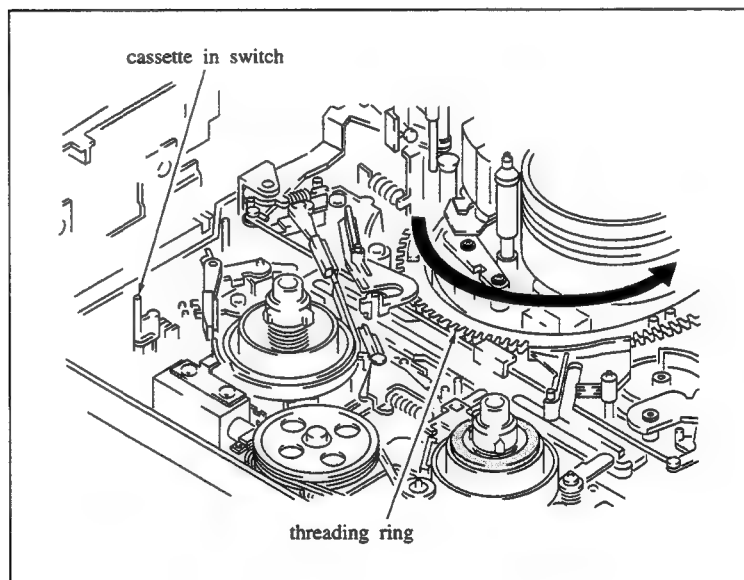
In order to put into the threading end mode without inserting a cassette tape :

**Method 1:**

- Turn the POWER switch ON. Push down a cassette compartment lock switch to get locked state.

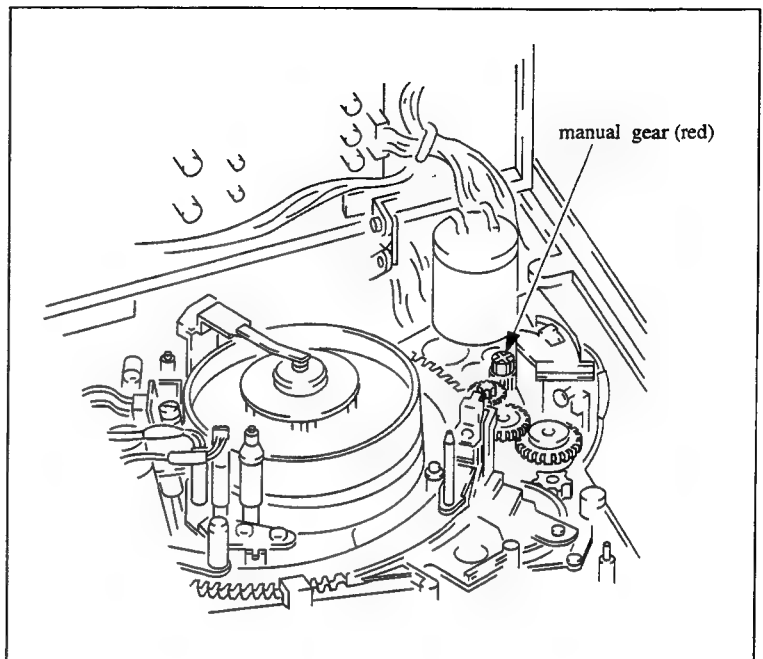


- Push a cassette in switch shown in the figure.
- Threading ring rotates in the counterclockwise direction and stops.

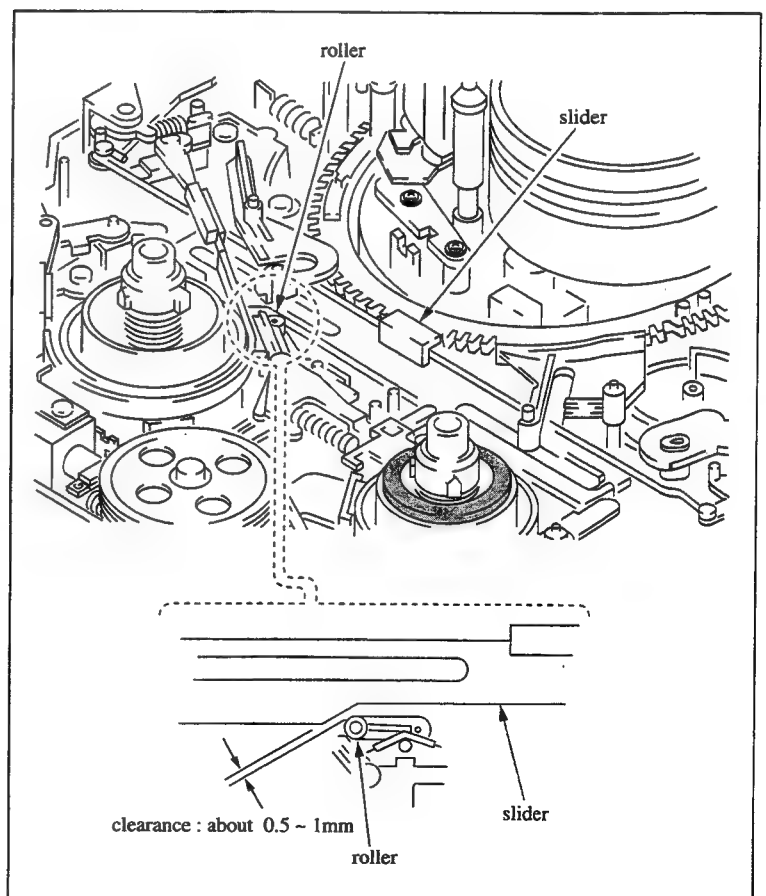


**Method 2:**

- Rotate a manual gear using a philips type 2mm dia. screwdriver in the clockwise direction.



- When a slider moves into the condition shown in the figure, stop rotating the screwdriver.



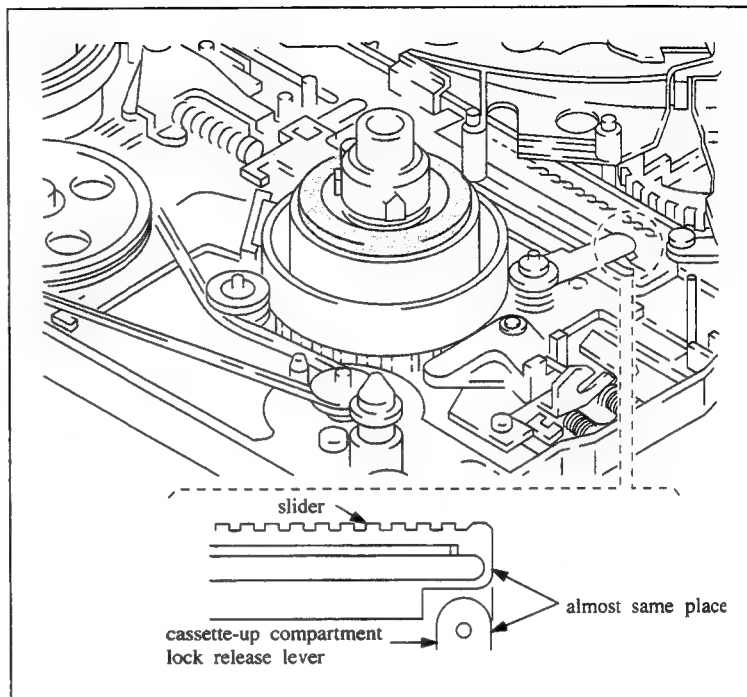
In order to put into the unthreading end mode without inserting a cassette tape:

**Method 1:**

- Push the EJECT button while in the threading end mode.

**Method 2:**

- Rotate the manual gear using a philips type 2mm dia. screwdriver in the counterclockwise direction. When the slider moves into the condition shown in the figure, stop rotating the screwdriver.



**4. Stop mode**

STOP mode is similar to the threading end as the mode, but the position of the slider is slightly different from the threading end mode.

In order to put into STOP mode without inserting a cassette tape:

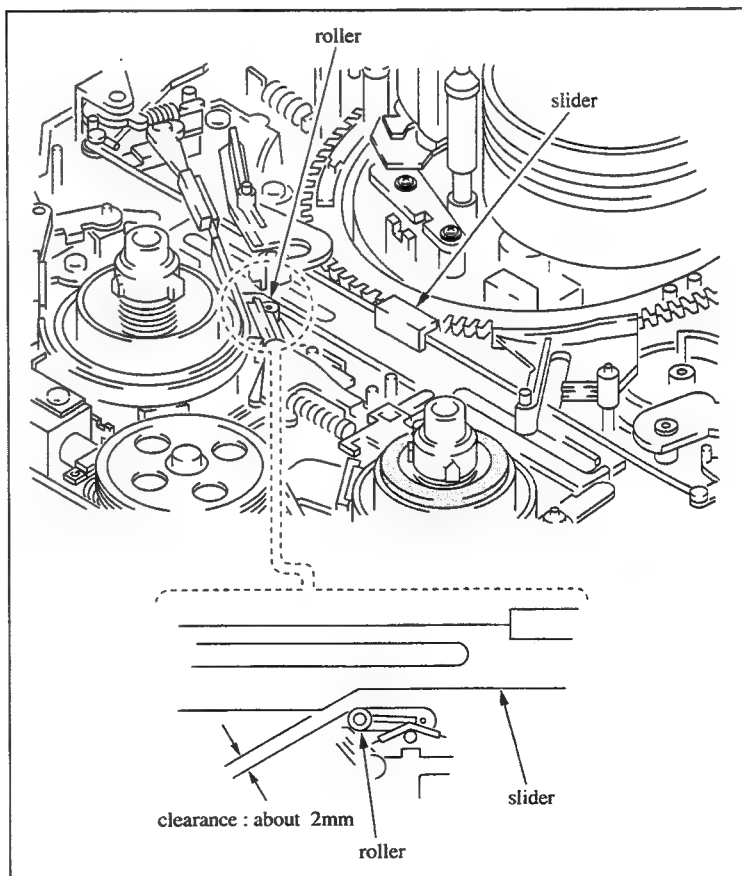
**Method 1:**

- Put the switch S5 on SS-46P board in "SLACK MUTE ON" state.
- Turn the POWER switch ON.
- Press down the cassette compartment lock switch to get locked state.
- Push the cassette in switch.
- Threading ring rotates in the counterclockwise direction and stops.
- Push the PLAY button to put into play mode tentatively.
- Push the STOP button.

**Note:** After the completion of replacement and/or adjustment, be sure to put the switch S5 on SS-46P board back to "SLACK MUTE OFF" state.

**Method 2:**

- Rotate the manual gear using a philips type 2mm dia. screwdriver in the clockwise direction.
- When the slider moves to the state shown in the figure, stop rotating the screwdriver.





## 5. PLAY mode

PLAY mode means the conditions where the pinch roller is pressed against the capstan shaft after STOP mode.

In order to put into PLAY mode without inserting a cassette tape:

### Method 1:

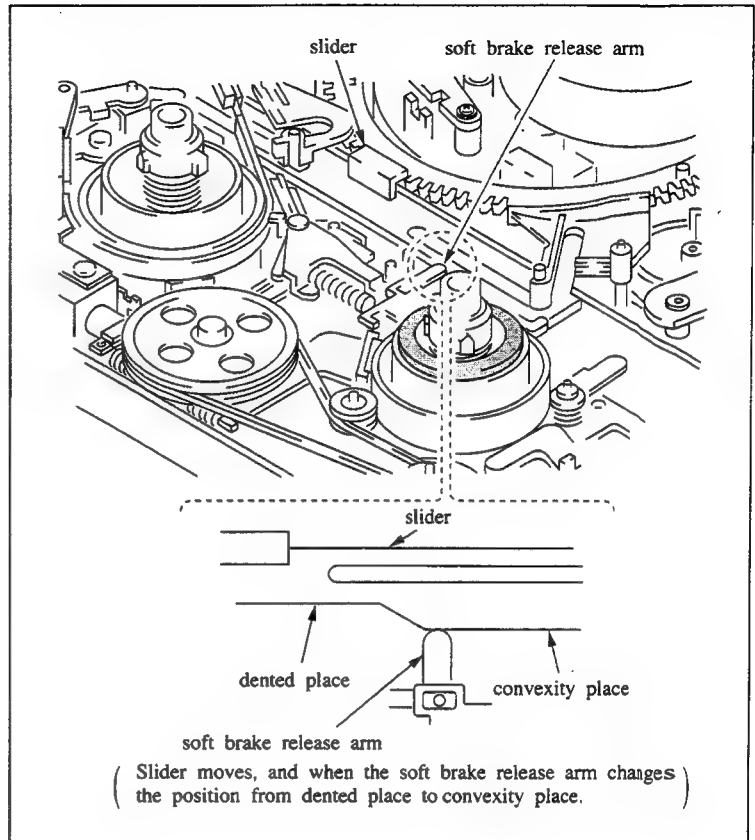
- Put the switch S5 of SS-46P board in "SLACK MUTE ON" state.
- Put the unit into STOP mode.
- Press the PLAY button.

**Note:** After the completion of replacement and/or adjustment, be sure to put the switch S5 on SS-46P board back to "SLACK MUTE OFF" state.

### Method 2:

- Rotate the manual gear using a philips type 2mm dia. screwdriver in the clockwise direction, and put into STOP mode.
- When the slider moves to the state indicated in the figure, stop rotating the screwdriver.

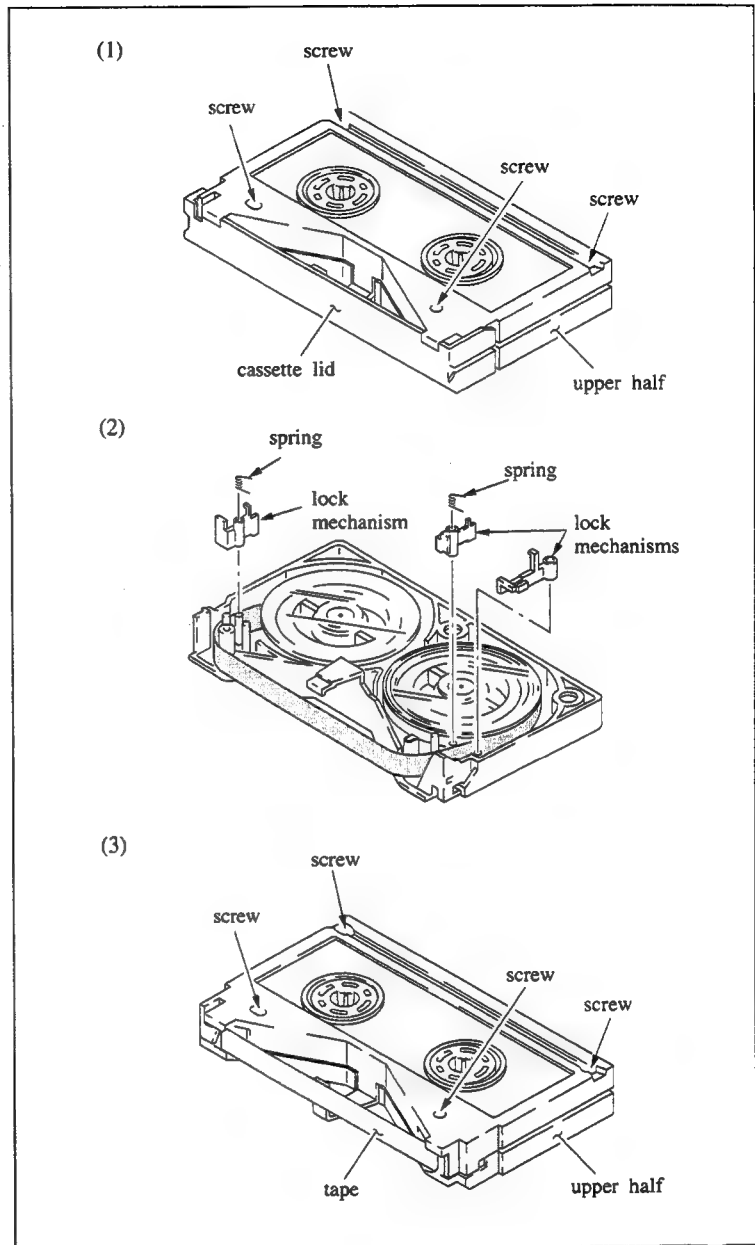
**Note:** Be sure not to rotate the gear further from this state, if rotate the gear further, the gear may be broken.



#### 6. How to make a cassette tape without lid

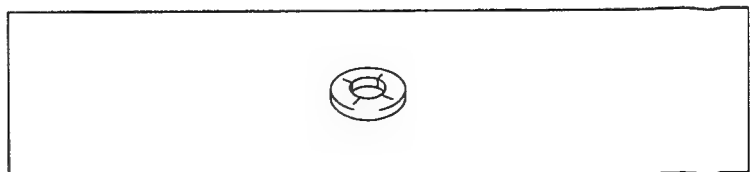
Since this unit is designed to be compact, the check and adjustment cannot be performed if a cassette tape lid is installed. Remove the cassette tape lid as follows:

- (1) Remove four screws on the back of the cassette tape as shown in the figure, and remove an upper half of the cassette.
- (2) Remove the lock mechanisms parts and springs both at left and right sides, and remove the cassette lid from the upper half.
- (3) Install the upper half on the lower half with four screws from the back side.



#### 7. Stop ring

If a stop ring is deformed when replacing part, replace it with a new one:  
Stop ring dia 1.5mm: 3-669-465-00



## 8. Oil

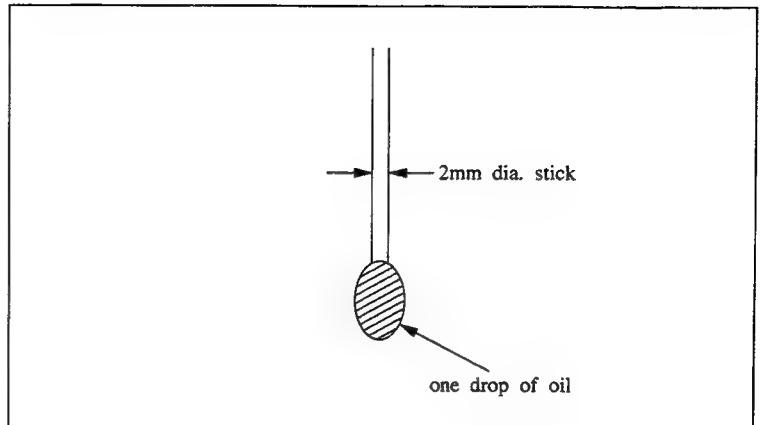
Apply only the specified oil when oiling is required for replacing parts and/or adjustment. If a different oil is used, major malfunctions may be caused due to differences in oil viscosity and ingredients.

SONY part number: 7-661-018-18

If oil is used that has been mixed with dust, shafts and bearings may be damaged, causing major malfunctions.

One drop of oil is defined as follows:

About the amount that will adhere to the end of a stick 2 mm in diameter, as shown in the figure.



## 9. Grease

Smear only the specified grease product to sliding part. If a different grease is used, major malfunctions may be caused due to differences in viscosity and ingredients.

SONY part number: 7-662-010-04

Major malfunctions may also be caused by using grease that has been mixed with dust.

Amounts of grease to smear

Smear just enough grease to create a thin film on the surface of the part. Any grease that adheres to other surrounding parts must be removed with gauze or soft cloth.

### 3-1-1. Index to adjustment items

The following is an alphabetical listing of the adjustment items contained in section 3. Use this index to find desired adjustment items.

Adjustment item	Section number	Page
Brake solenoid position adjustment	3-15	3-58
FWD back tension adjustment	3-8	3-36
FWD torque adjustment	3-30	3-96
Gear assembly engagement adjustment	3-22	3-82
Main brake release adjustment	3-15	3-58
Pinch arm assembly vertical play adjustment	3-7	3-27
Pinch press block position adjustment	3-20	3-72
Pinch press lever height adjustment	3-7	3-28
Pull-lod position adjustment	3-8	3-34
S main brake clearance adjustment	3-9	3-40
S main brake torque adjustment	3-9	3-40
S soft brake clearance check	3-11	3-46
S soft brake operation check	3-11	3-46
S soft reinforcement brake torque adjustment	3-11	3-47
Supply reel table height adjustment	3-13	3-52
T main brake clearance adjustment	3-10	3-42
T main brake torque adjustment	3-10	3-43
T soft brake clearance check	3-12	3-49
T soft brake operation check	3-12	3-50
Take-up reel table height adjustment	3-14	3-54
Tension regulator operating position adjustment	3-8	3-32
Tension regulator rollor slantness adjustment	3-19	3-68
Threading ring rotation adjustment	3-21	3-78
Upper drum eccentricity adjustment	3-2	3-16

### 3-2. UPPER DRUM ASSEMBLY REPLACEMENT

- When the video heads are worn or damaged, replace an upper drum assembly.
- When the upper drum assembly is removed, if a spacer is placed on the flange, be sure to leave it in place on the flange. If the spacer is lost or replaced with one of a difference thickness, the height of the video head from its reference surface will be changed, making it impossible to get interchangeability.
- The upper drum assembly is a periodic replacement part. It is recommended to be replaced periodically based on the periodic maintenance table.

#### Tools

Upper drum eccentricity gauge (2) : J-6001-830-A

Upper drum eccentricity gauge (3) : J-6001-820-A

Upper drum eccentricity gauge (5) : J-6087-000-A

Upper drum eccentricity gauge (6) : J-6325-530-A

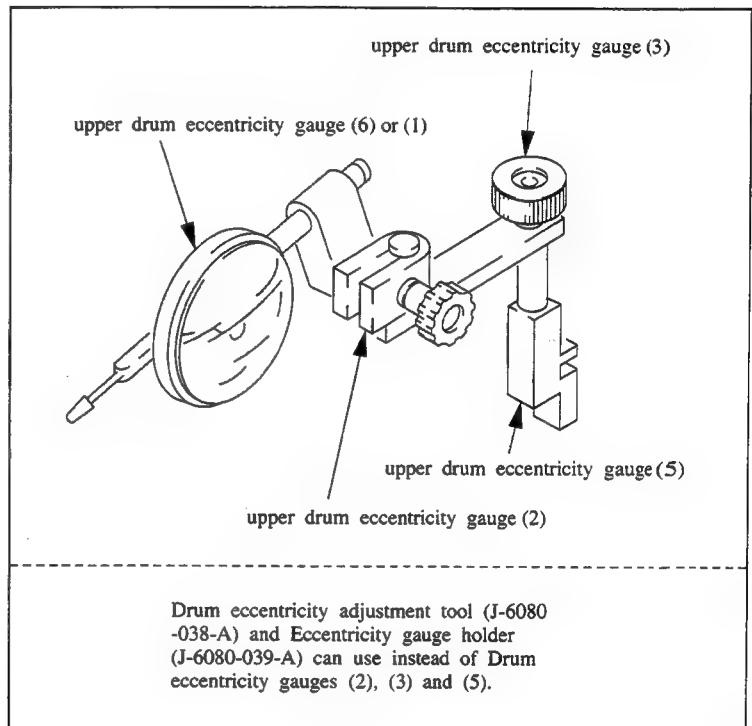
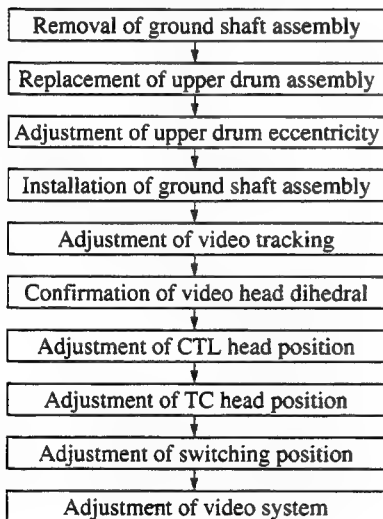
or (1) : J-6001-840-A

Cleaning piece : 2-034-697-00

Cleaning fluid : 9-919-573-01

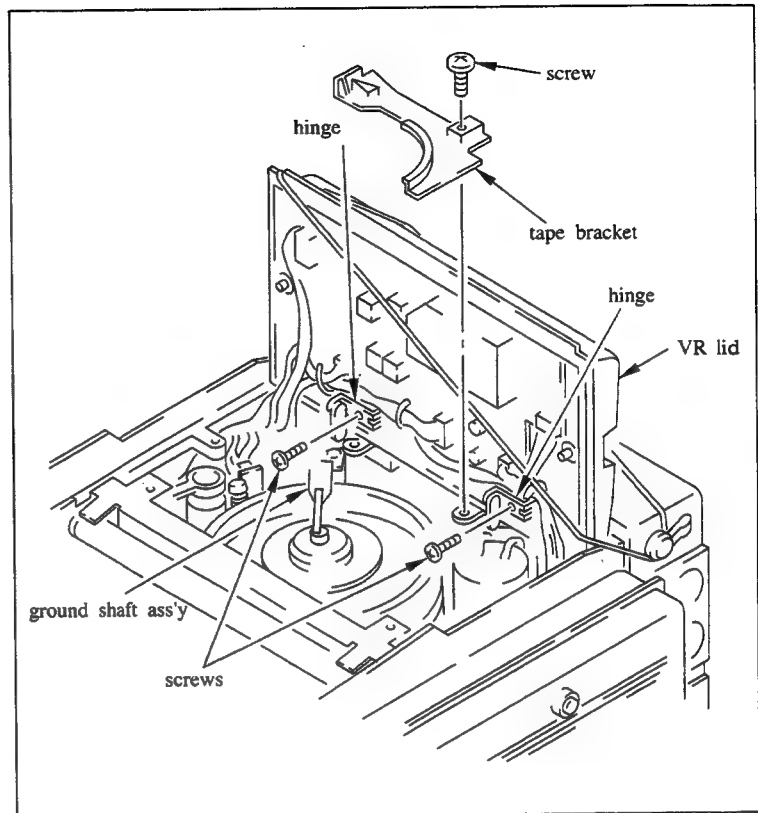
Assemble the upper drum eccentricity gauges as shown in the figure.

#### Replacement flow chart

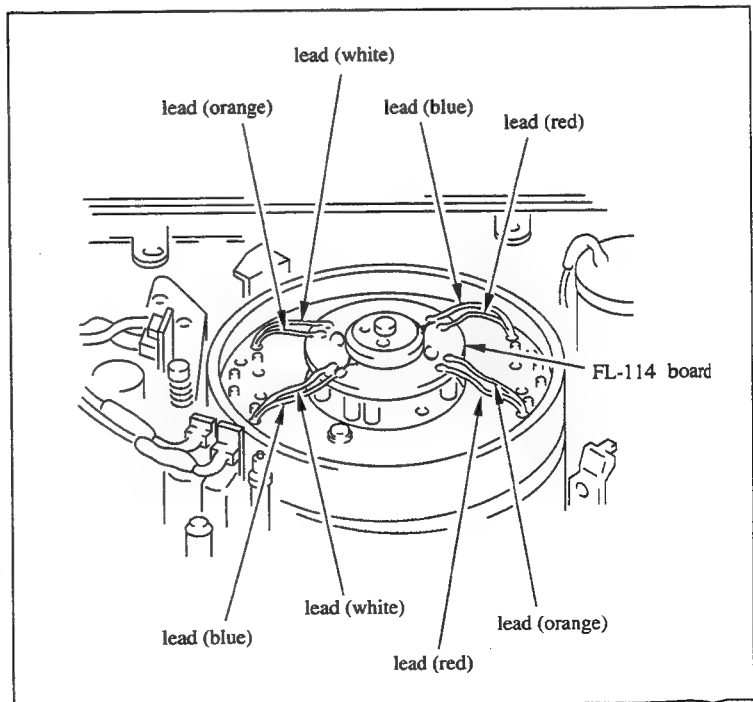


### Removal

1. Remove a screw of a tape holder, and remove the tape holder.
2. Remove two fixing screws of two hinges on the right and left sides of a VR lid, and remove the VR lid. The harness is not disconnected from the VR lid.
3. Remove a ground shaft assembly.  
(Refer to Section 3-3.)



4. Unsolder eight leads of the video heads soldered to FL-114 board in the drum's center.



5. Remove two screws holding an upper drum assembly, and lift the upper drum assembly straight up to remove.

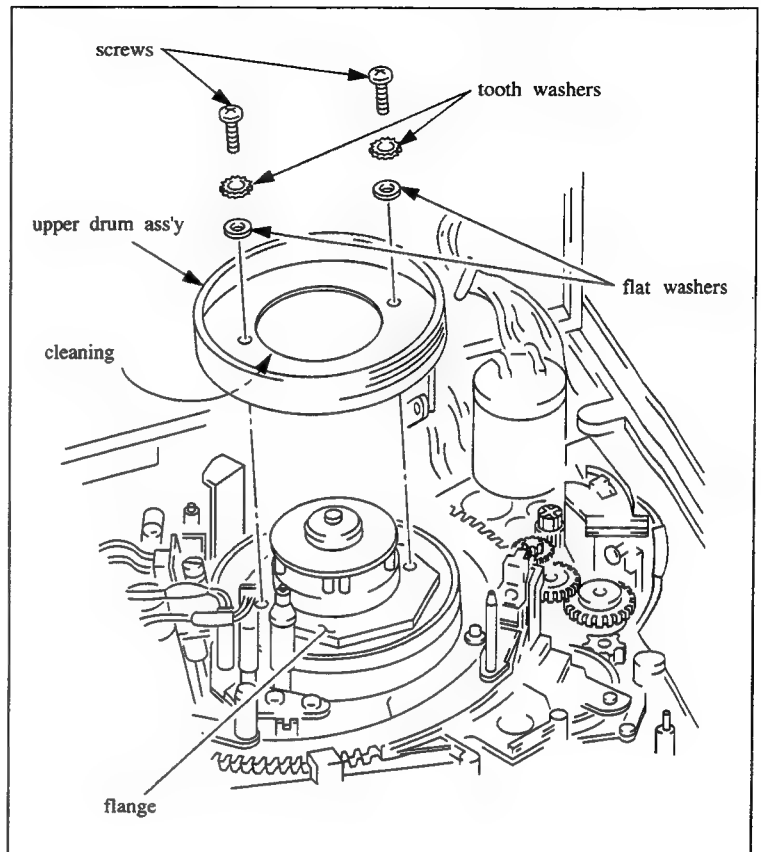
#### Installation

6. Clean the flange surface of a lower drum and the installation surface of a new upper drum assembly with cleaning piece moistened with cleaning fluid.
7. As shown in the figure, place the white and blue leads of the upper drum assembly on the flange. And tighten the upper drum assembly with two screws snugly, but do not tighten.

**Note 1:** When placing the upper drum assembly on the lower drum, never make a scratch or otherwise damage on the tape surface and video heads of the upper drum assembly.

**Note 2:** When placing the upper drum assembly on the lower drum, pay particular attention to install in the correct position.

8. Solder eight leads of the upper drum assembly wires to FL-114 board in the positions shown in the figure.



### Adjustments after replacement

9. Install the upper drum eccentricity gauges to the holes on a rear panel as shown in the figure.

- (1) Clean the pointer of the gauge with a cleaning piece moistened with cleaning fluid.

**Note:** The tape running surface of the upper drum may be damaged if the gauge is used with dirt or dust adhering to the pointer.

- (2) Install the gauge so that the pointer is positioned about 5mm away from the upper edge of the upper drum assembly.

**Note:** Pay particular attention not to touch the pointer to the video heads.

10. Perform the **upper drum eccentricity adjustment**.

- (1) Turn the upper drum slowly in the clockwise direction. Make sure that the pointer deviation indicated in one full turn of the upper drum satisfies the specification.

**Specification:**  $3\mu$  or less.

If the specification is satisfied, perform sub-step (3) and later.

If the specification is not satisfied, perform sub-step (2) and later.

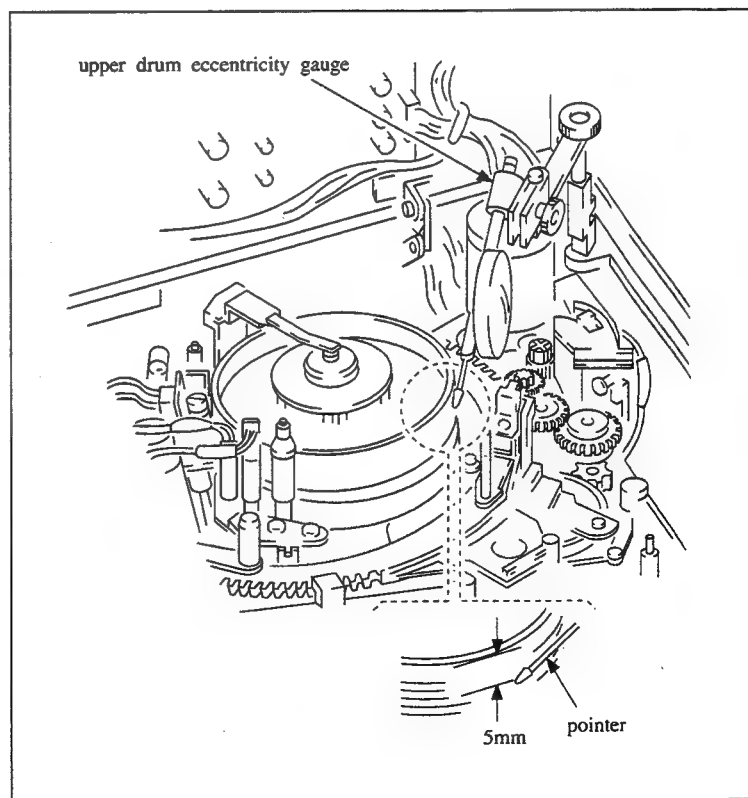
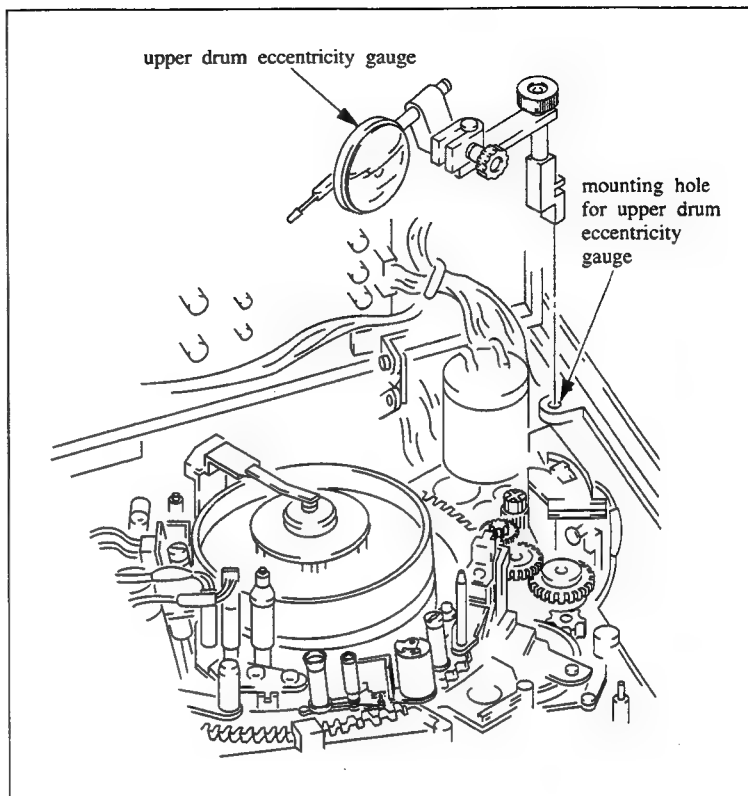
- (2) Perform if the specification is not satisfied: Turn the upper drum slowly in the clockwise direction, and make sure that the amount of the pointer deviation.

Turn the upper drum slowly in the clockwise direction, and stop the turning at the place where the least pointer deviation is indicated.

Adjust the position of the upper drum to about one-half the amount of the pointer deviation by pressing with finger against the upper edge of the upper drum assembly at a point 180 degrees opposed to the contact point of pointer. If no movement is produced by this adjustment, slightly loosen two screws of the drum assembly. If the movement occurs too readily, tighten two screws slightly.

Make sure that the eccentricity again to satisfy the specification.

- (3) Tighten two screws alternately and gradually (tightening torque: 8kg-cm).
- (4) Make sure that the eccentricity of the upper drum to satisfy the specification.





11. Remove the upper drum eccentricity gauges.  
**Note:** Take care not to contact the pointer with the video heads.
12. Install the ground shaft assembly.  
(Refer to Section 3-3.)
13. Install the left/right hinges to the VR lid.
14. Clean the video heads and tape running surface of the upper drum assembly with a cleaning piece moistened with cleaning fluid. After cleaning, be sure to clean the cleaned surface two or three times with a soft dry cleaning piece.
15. Perform video tracking adjustment.  
(Refer to Section 4-3.)
16. Perform confirmation of video head dihedral.  
(Refer to Section 4-13.)
17. Perform CTL head position adjustment.  
(Refer to Section 4-8.)
18. Perform TC head position adjustment.  
(Refer to Section 4-12.)
19. Perform switching position adjustment.  
(Refer to Section 4-14.)
20. Perform the video system adjustment.  
(Refer to Section 5-2-1.)

### 3-3. GROUND SHAFT ASSEMBLY REPLACEMENT

- When a ground shaft becomes worn, white noise may appear on the monitor screen. In this case, replace the ground shaft.
- Do not apply excessive force or try to bend the ground shaft assembly.
- The ground shaft assembly is a periodic replacement part. It is recommended to replace periodically based on the periodic maintenance table.

#### Tools

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01

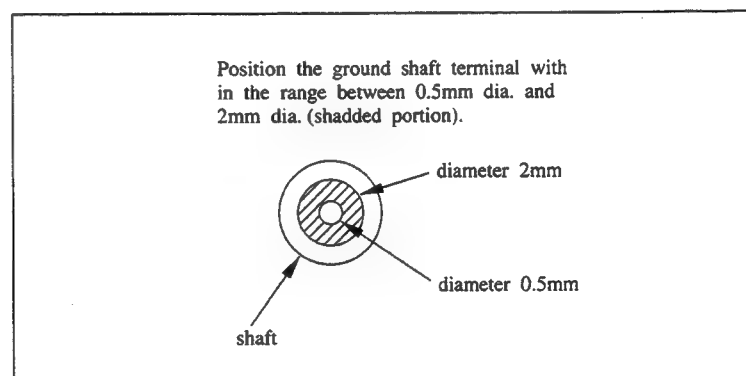
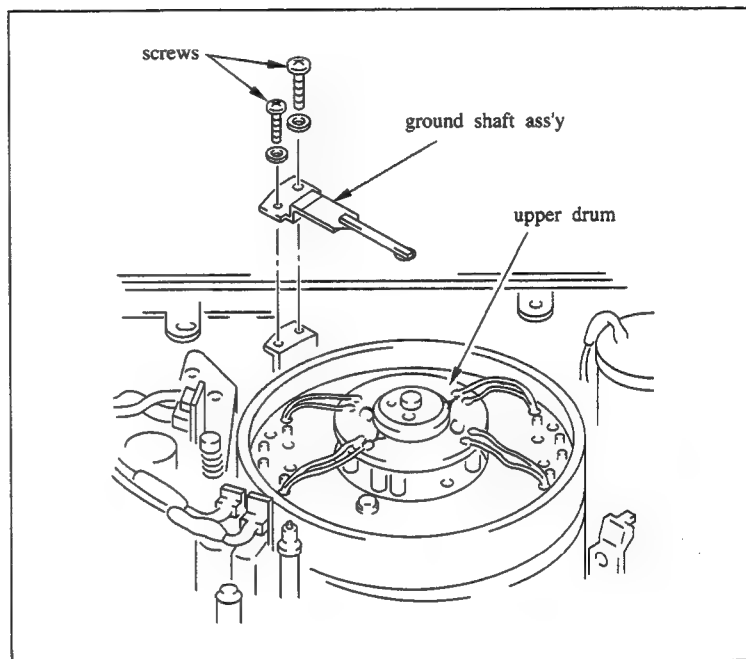
#### Removal and installation

1. Remove two screws of the ground shaft assembly, and remove the ground shaft assembly.
2. Clean the contacting surface of the upper parts of the drum which is contacted by the ground shaft with a cleaning piece moistened with cleaning fluid. After cleaning, be sure to clean the cleaned surface two or three times with a soft dry cleaning piece.
3. Clean the protrusion on the new ground shaft assembly gently with a cleaning piece moistened with cleaning fluid. After cleaning, be sure to clean the cleaned surface two or three times with a soft dry cleaning piece.

**Note:** When cleaning the ground shaft assembly, never apply excessive force or try to bend the ground shaft assembly.

4. Clean the mounting place of the drum and the installation surface on a new ground shaft assembly with a cleaning piece moistened with cleaning fluid.
5. Install a new ground shaft assembly so that the protrusion on its end fits the shaded portion of the contact surface on top of the drum as shown in the figure; tighten it with two screws.

**Note:** When installing the ground shaft assembly, never apply excessive force or try to bend it.



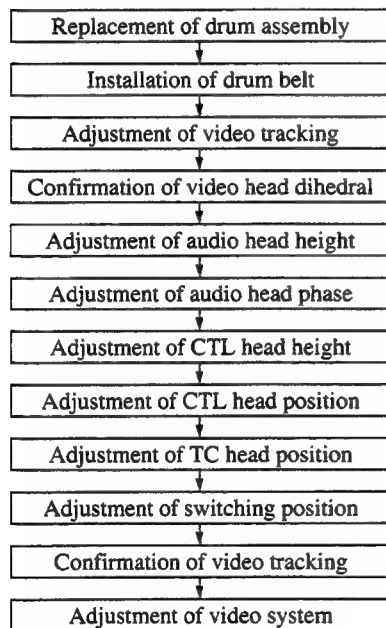
### 3-4. DRUM ASSEMBLY REPLACEMENT

- A drum assembly is a periodic replacement part. It is recommended to replace periodically based on the periodic maintenance table.
- It is necessary to replace the drum assembly in the following cases:
  - (1) The lead surface of the lower drum is worn, and a correct RF waveform cannot be obtained even when tracking adjustments are performed.
  - (2) The lower drum's lead surface and tape running surface of the lower drum are scratched and cannot be repaired.
  - (3) The drum shaft bearings are out of life, resulting in noise or jitter that makes it impossible to maintain the performance of the unit.
- When replacing the drum assembly, replace the upper drum assembly at the same time.

#### Tools

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01

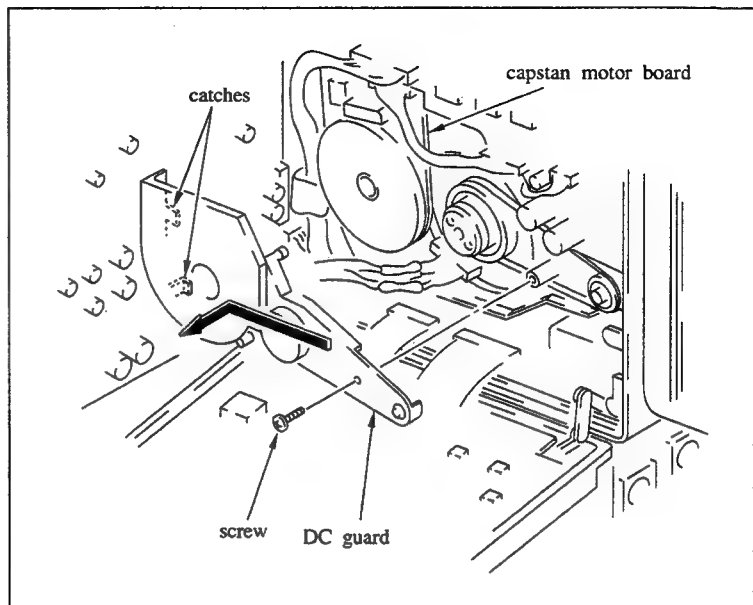
#### Replacement flow chart



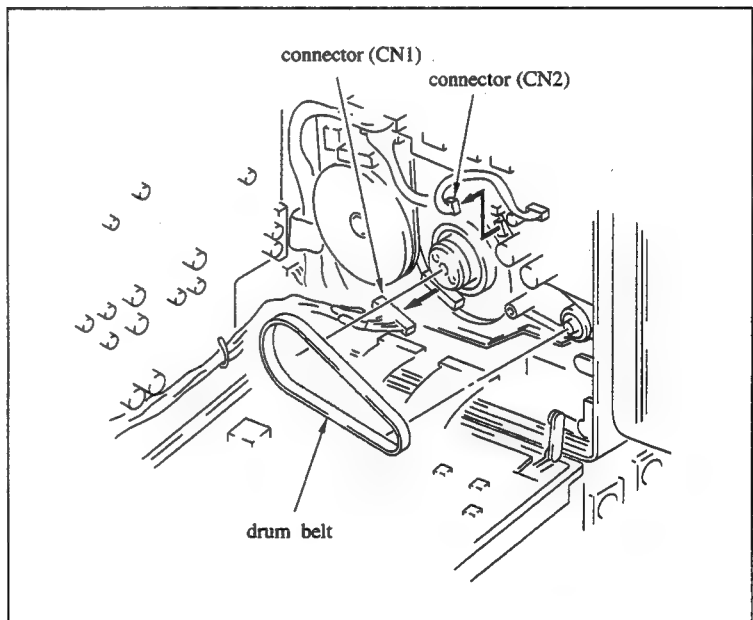
### Removal

1. Remove a tape holder. (Refer to Section 3-2.)
2. Open a side panel. (Refer to Section 1-12.)
3. Open VO-34P board. (Refer to Section 1-13.)
4. Stand the unit keeping the connector box down.
5. Remove one screw shown in the figure, and move a DC guard in the direction of the arrow to remove.

**Note:** The catches on the left side of the DC guard are hooked under the capstan motor board.



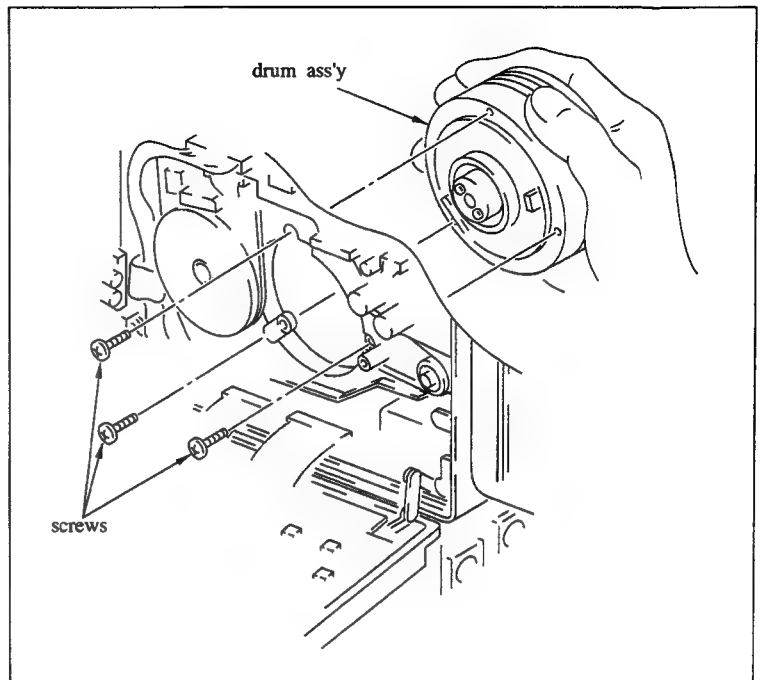
6. Remove a drum belt.
7. Disconnect two connectors connected to a drum assembly.



8. Remove three screws holding the drum assembly, and remove the drum assembly.

**Note 1:** Hold the drum assembly with hands to prevent it from dropping.

**Note 2:** Be careful not to damage the guides and other parts surrounding the drum assembly.



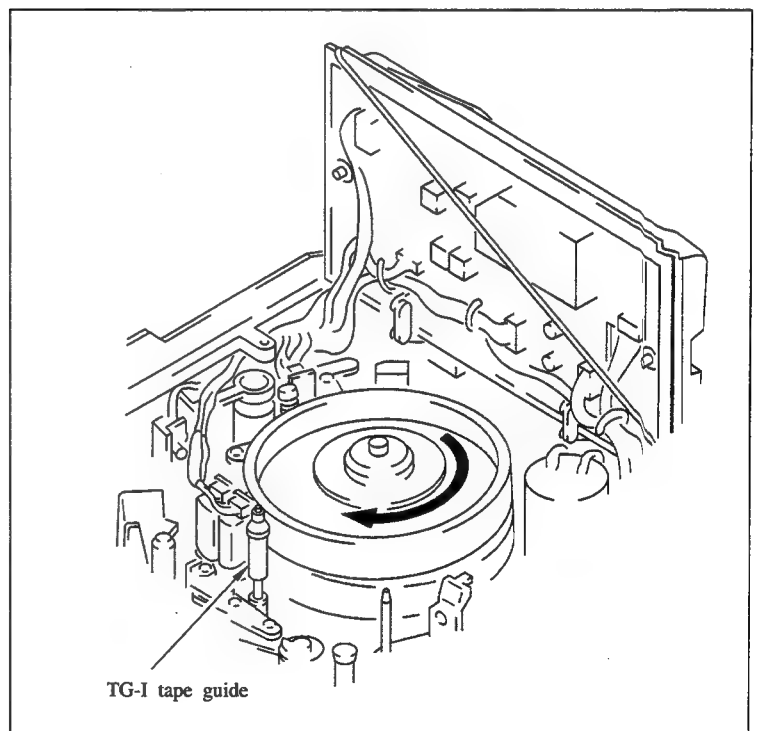
#### Installation

9. Clean a new drum assembly mounting surface and the chassis with cleaning piece moistened with cleaning fluid.
10. Install the new drum.

- (1) Install the drum assembly on the chassis so that the drum seal affixed on the drum is to the reel table side, and tighten it with three screws snugly, but do not tighten.

**Note:** Take care not to damage the tape running surface of the upper drum, the video heads, the lower drum's tape running surface of the lower drum and the lead of the lower drum. Also, be careful not to damage the guides and other parts around the drum.

- (2) Turn the drum assembly fully in the direction of the arrow, and while pushing toward a TG-I tape guide side, tighten the screws (tightening torque: 8kg-cm).
- (3) Confirm that there is no play in the drum assembly.



11. Connect two connectors to the drum assembly.
12. Install the drum belt. (Refer to Section 3-6.)  
**Note:** Be sure to install the drum belt with the white marker on the belt outside.
13. Install the DC guard by reversing the order of step 5. Make sure that the catches on the left side of the DC guard go underneath the capstan motor board to support the board, and that the pins fit securely into their chassis holes.
14. Tighten the DC guard with a screw.
15. Close VO-34P board, and tighten with two screws. (Refer to Section 1-13.)
16. Close the side panel. (Refer to Section 1-12.)
17. Place the unit with the side panel down.
18. Clean the tape running surface of the drum assembly with a cleaning piece moistened with cleaning fluid. After cleaning, be sure to clean the cleaned surface two or three times with a soft dry cleaning piece. (Refer to Section 2-2.)
19. Perform video tracking adjustment.  
(Refer to Section 4-3.)
20. Confirmation of video head dihedral.  
(Refer to Section 4-13.)
21. Perform audio head height adjustment.  
(Refer to Section 4-10.)
22. Perform audio head phase adjustment.  
(Refer to Section 4-11.)
23. Perform CTL head height adjustment.  
(Refer to Section 4-7.)
24. Perform CTL head position adjustment.  
(Refer to Section 4-8.)
25. Perform TC head position adjustment.  
(Refer to Section 4-12.)
26. Perform switching position adjustment.  
(Refer to Section 4-14.)
27. Perform confirmation of video tracking adjustment. (Refer to Section 4-3.)
28. Perform video system adjustment.  
(Refer to Section 5-2-1.)

### 3-5. REEL BELT REPLACEMENT

#### Tools

Cleaning price : 2-034-697-00

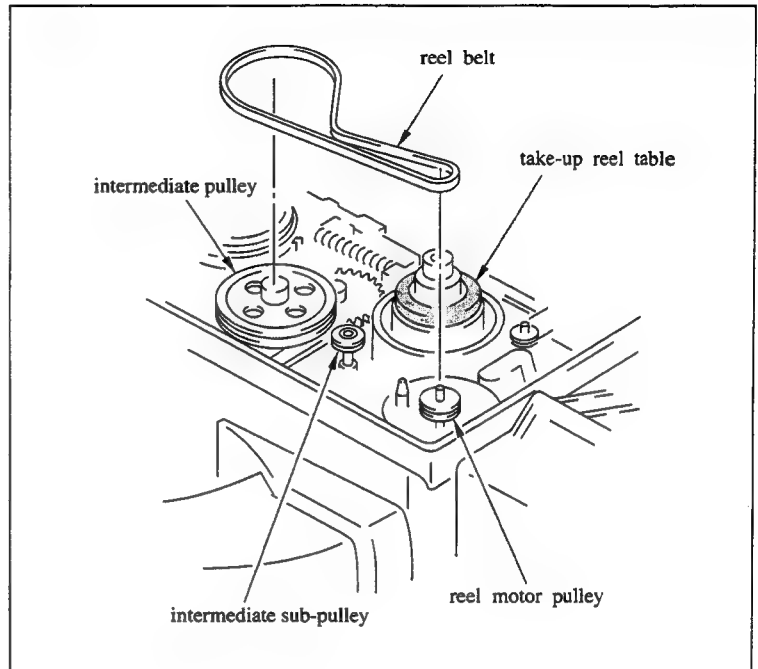
Cleaning fluid : 9-919-573-01

#### Removal

1. Place the unit with its side panel down.
2. Remove a reel belt from a reel motor pulley, intermediate sub-pulley and intermediate pulley.

#### Installation

3. Clean the following parts with a cleaning piece moistened with cleaning fluid:
  - Reel motor pulley
  - Intermediate sub-pulley
  - Intermediate pulley
  - New reel belt
4. Install a new reel belt as shown in the figure.
5. Rotate the intermediate pulley two or three turns in the counterclockwise direction, and make sure that the belt is installed on its pulleys correctly, and not twisted.



### 3-6. DRUM BELT REPLACEMENT

#### Tools

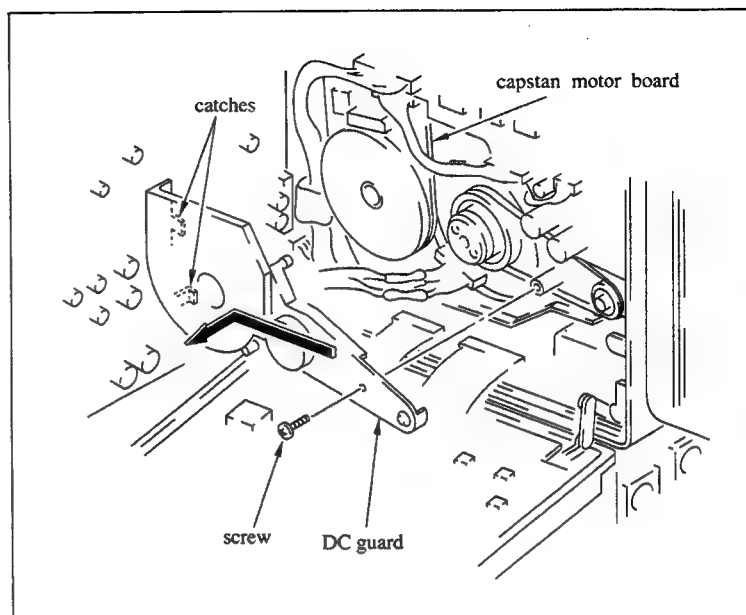
Cleaning piece : 2-034-697-00

Cleaning fluid : 9-919-573-01

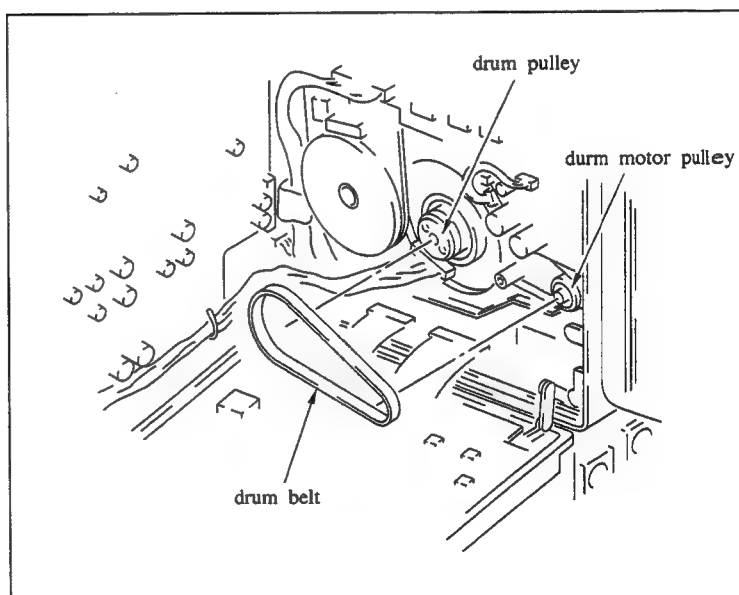
#### Removal

1. Open a side panel. (Refer to Section 1-12.)
2. Open VO-34P board. (Refer to Section 1-13.)
3. Set the unit with a VR lid down.
4. As shown in the figure, remove one screw, and move a DC Guard in the direction of the arrow to remove.

**Note:** The catches on the left side of the DC guard are hooked under the capstan motor board.



5. Remove a drum belt from a drum motor pulley and drum pulley.





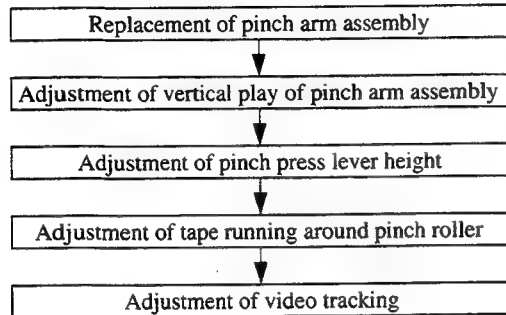
### **Installation**

6. Clean the following parts with a cleaning piece moistened with cleaning fluid:
  - Drum motor pulley
  - Drum pulley
  - New drum pulley
7. Install the drum belt on the drum motor pulley with white marker on the belt outside.
8. While rotating the drum pulley by hand in clockwise direction, install the drum belt onto the drum pulley correctly.
9. Rotate the drum pulley clockwise two or three turns by hand, and make sure that the drum belt stays in the center of the drum pulley and drum motor pulley.
10. Install the DC guard by reversing the order of step 4. Make sure that the catches on the left side of the DC guard go underneath the capstan motor board to support the board, and that the pins fit securely into their chassis holes.
11. Tighten the DC guard with one screw.
12. Close VO-34P board, and tighten with two screws. (Refer to Section 1-13.)
13. Close the side panel. (Refer to Section 1-12.)

### 3-7. PINCH ROLLER REPLACEMENT

- Replace a pinch arm assembly when a pinch roller is worn or damaged.

#### Replacement flow chart



#### Tools

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01

#### Removal

1. Put the unit into the unthreading end mode. (Refer to Section 3-1.)
2. Remove a stop ring and polyslider washer on the upper end of a pinch arm assembly.

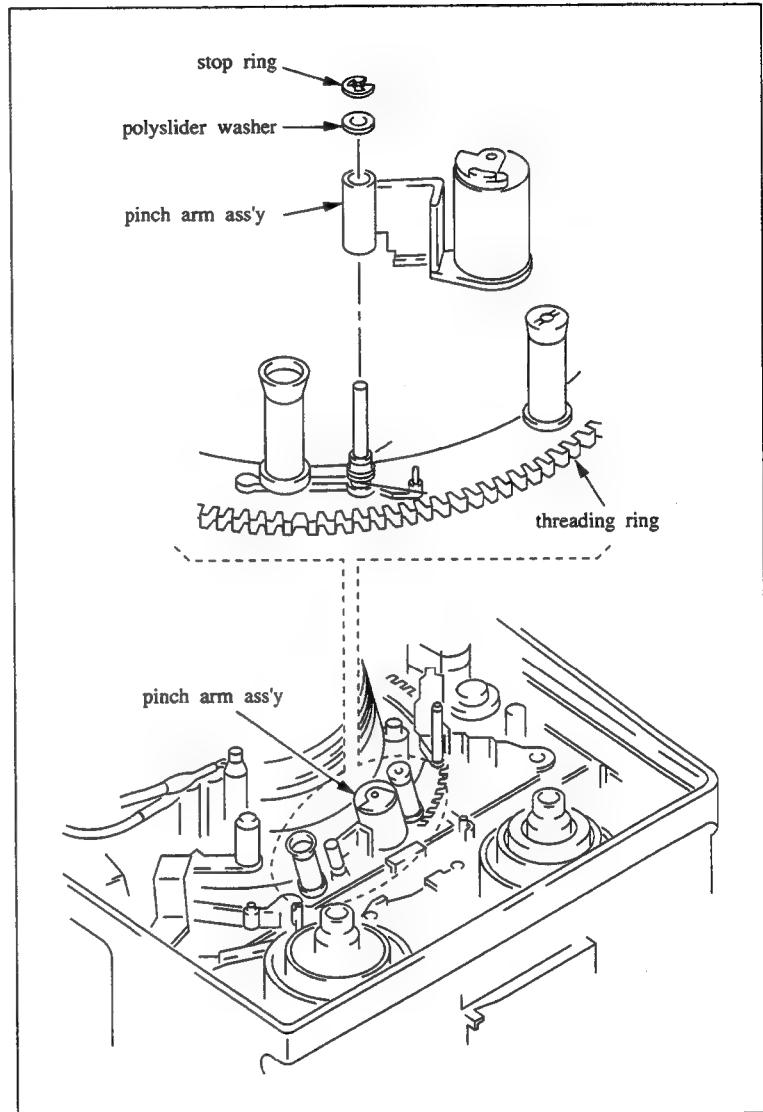
**Note 1:** When removing the stop ring, do not press or bend the tape guides and other parts above a threading ring.

3. Remove the pinch arm assembly from the threading ring.

**Note 1:** Do not remove the polyslider washer and torsion spring at the bottom of the pinch arm assembly.

**Note 2:** Be careful not to lose polyslider washer at the lower part of the pinch arm assembly when the pinch arm assembly is removed. It may detach together with the pinch arm assembly.

**Note 3:** If in case polyslider washer is detached, install it to the pinch arm shaft.



### Installation

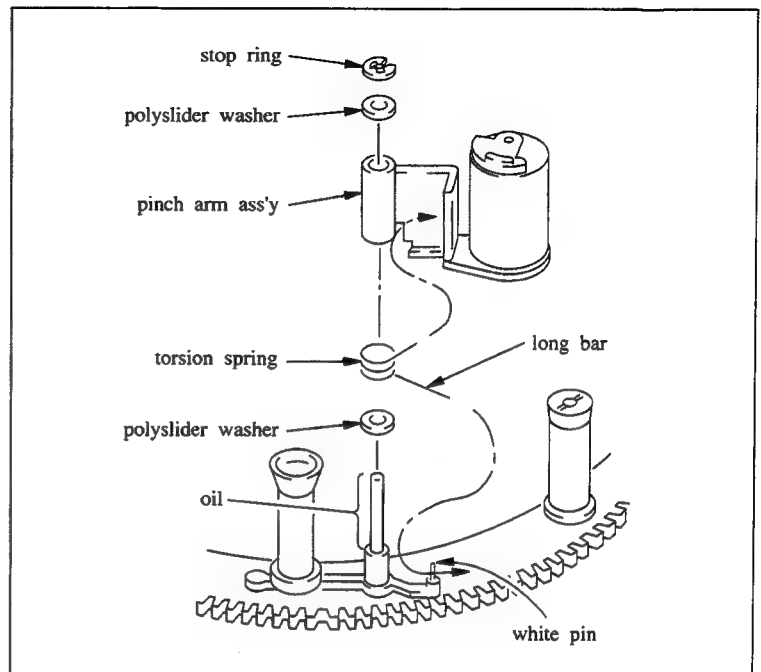
4. Clean the pinch arm shaft with a cotton swab moistened with oil. (This step means that apply oil to the pinch arm shaft slightly.)
5. Set the torsion spring as shown in the figure and install a new pinch arm assembly.

**Note 1:** Install the torsion spring so that the long bar is on the white pin side on the threading ring, and the short bar is behind the pinch arm assembly.

**Note 2:** When installing the pinch arm assembly, do not press or bend the tape guides and other parts on the threading ring.

**Note 3:** Using tweezers to install the torsion spring will help to easy installation.

6. Insert the polyslider washer above the pinch arm assembly, and tighten with the stop ring.
7. Clean the new pinch roller with a cleaning piece moistened with cleaning fluid.



### Adjustments after replacement

8. Perform the **vertical play adjustment of the pinch arm assembly**.

- (1) Hold the pinch arm assembly with finger and move it up and down. Make sure that the amount of vertical play satisfies the specification.

If the specification is satisfied, perform sub-step (3) and later.

If not, perform sub-step (2) and later.

- (2) Perform this sub-step if the specification is not satisfied:

- [1] Remove the stop ring and adjust the thickness of the polyslider washers installed above the pinch arm assembly so that the specification is satisfied.

Polyslider washers for adjustment:

1.6 mm diameter : 0.13 mm thickness

Part No. 3-701-436-01

1.6 mm diameter : 0.25 mm thickness

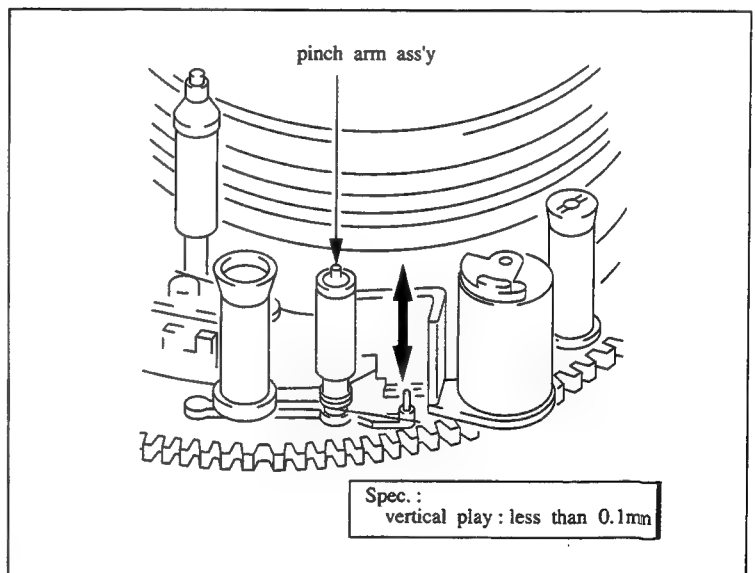
Part No. 3-701-436-11

1.6 mm diameter : 0.5 mm thickness

Part No. 3-701-436-21

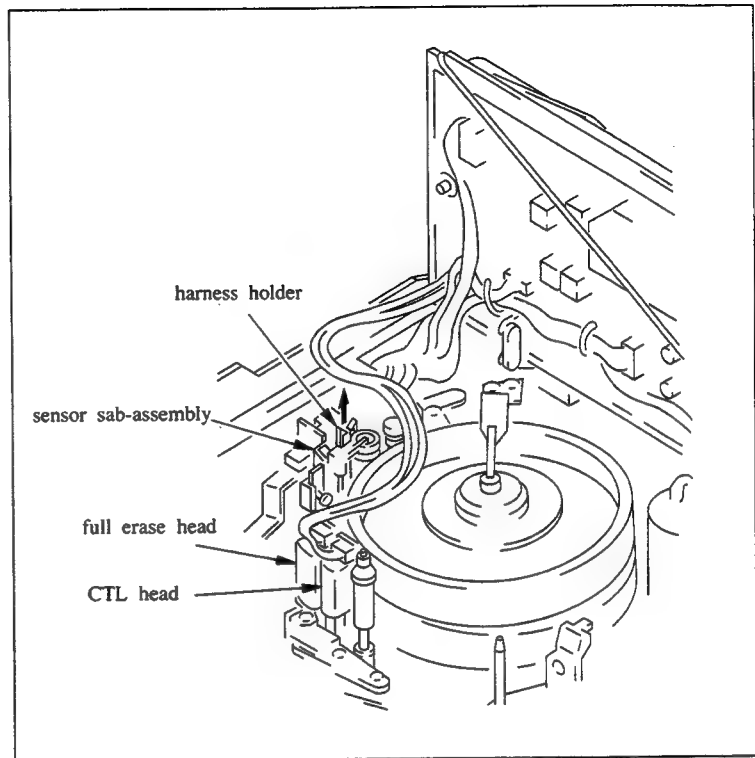
- [2] Tighten with the stop ring and check again whether the specification is satisfied.

- (3) Push the pinch arm assembly toward the drum with finger, then release the finger and make sure that it returns smoothly to its original position.

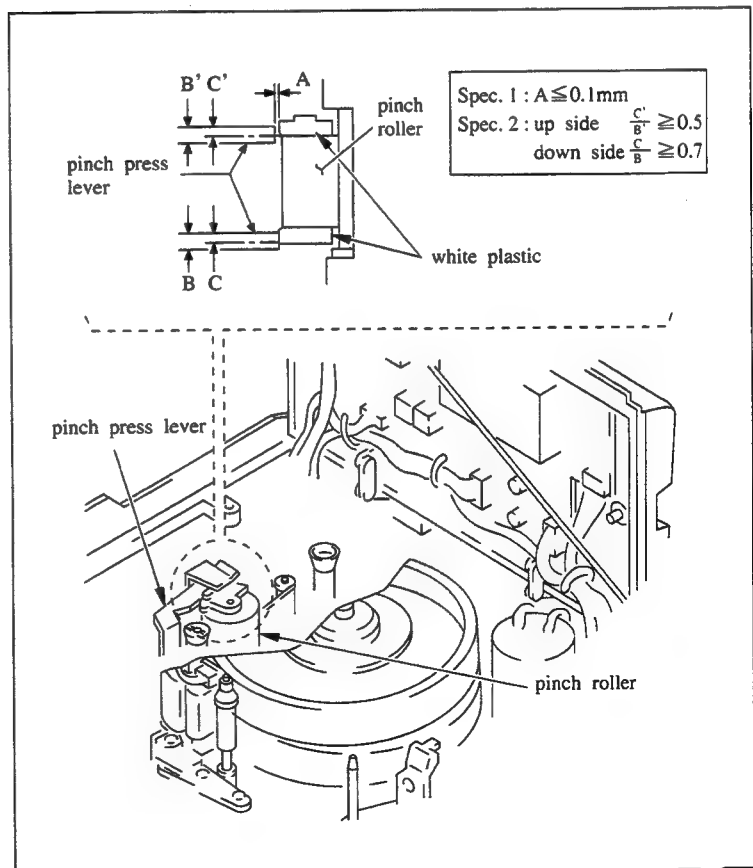


9. Perform the **pinch press lever height adjustment**:

- (1) Put the unit into the threading end state.  
(Refer to Section 3-1.)
- (2) Unhook the CTL head and full erase head harness from the harness holder of a sensor sub assembly.
- (3) Remove a screw of the sensor sub assembly, and lift up the sensor sub assembly with its harness attached.
- (4) Press the tension regulator arm gently with finger and move it to the reel table side.



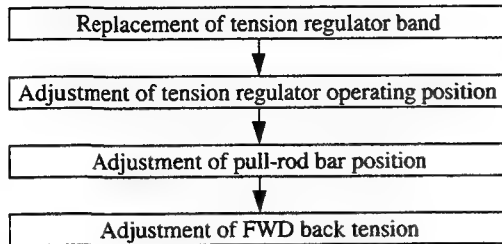
- (5) Make sure that the up side or down side of clearance between the pinch press lever, and white plastic part of the pinch roller is less than 0.1mm. (Spec. 1)  
Put the unit into PLAY mode, perform visual inspection of the engagement of the pinch press lever and the white plastic part of the pinch roller, and make sure that it satisfies the required specification.  
If both specifications 1 and 2 are satisfied, perform sub-step (7) and later.  
If both specifications 1 and 2 are not satisfied, perform sub-step (6) and later.



- (6) Perform this sub-step if the specification is not satisfied:
  - [1] Put the unit into unthreading end mode.  
(Refer to Section 3-1.)
  - [2] Adjust the amount of polyslider washers under the pinch arm assembly so that both specifications 1 and 2 are satisfied.  
**Note:** The polyslider washers used are the same as those used in step 8 vertical play adjustment of the pinch arm assembly.
  - [3] Perform the vertical play adjustment of the pinch arm assembly again.
- (7) Perform the threading and unthreading operations two or three times, and make sure that the specifications are satisfied.
- (8) Hook the harnesses for the CTL head and full erase head into the harness holder on the sensor sub-assembly.
- 10. Perform tape running adjustment around pinch roller. (Refer to Section 4-2-4.)
- 11. Perform video tracking adjustment.  
(Refer to Section 4-3.)

### 3-8. TENSION REGULATOR BAND REPLACEMENT

#### Replacement flow chart

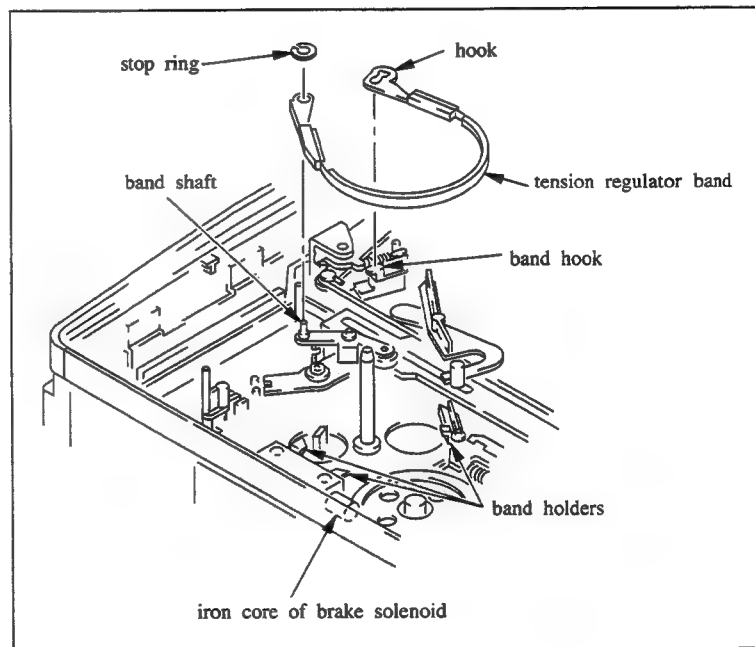


#### Tools

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01  
Cassette tape without lid (BCT-30M) (Refer to Section 3-1.)  
TENELOMETER (commercially available)  
Alligator clip (commercially available)

#### Removal

1. Make sure that the unit is in the unthreading end mode. (Refer to Section 3-1.)
2. Remove a stop ring at the top of a supply reel table with tweezers, then remove the supply reel table. (Refer to Section 3-13.)  
**Note:** Be carefull not to lose steel washer and polyslider washer at the lower part of the reel table when the reel table is removed. They may detach together with the reel table.
3. Disconnect a band hook of a tension regulator assembly from a band holder of a tension regulator assembly.
4. Remove a stop ring that holds the other end of the tension regulator band from a band shaft.
5. Remove the tension regulator band from the band shaft.



### **Installation**

6. Install a new tension regulator band onto the band shaft and band hook.

**Note 1:** When installing the tension regulator band, pay particular attention not to damage the band on the three band holders and other parts shown in the figure.

**Note 2:** When installing the tension regulator band, never twist or bend the band.

7. Fasten the tension regulator band to the band shaft with the stop ring.

**Note:** If the stop ring is deformed, replace with a new one.

Part No.: 3-669-465-00

8. Clean the surface of a reel table with a cleaning piece moistened with cleaning fluid.
9. Push an iron core of a brake solenoid to the energized position with tweezers, and while releasing the main brake, install the reel table onto the reel shaft.

**Note 1:** If the steel and polyslider washers came off when the reel table was removed, replace the steel washer first, then the polyslider washer onto the reel shaft, then apply a drop of oil to the shaft. (Refer to Section 3-13.)

**Note 2:** If the reel shaft was cleaned by mistake, apply a drop of oil to the shaft. (Refer to Section 3-13.)

**Note 3:** When installing the reel table, take care not to bend or otherwise damage the tension regulator band.

10. Fasten the supply reel table onto the reel shaft with the stop ring.

### Adjustments after replacement

#### 11. Perform the tension regulator operating position adjustment.

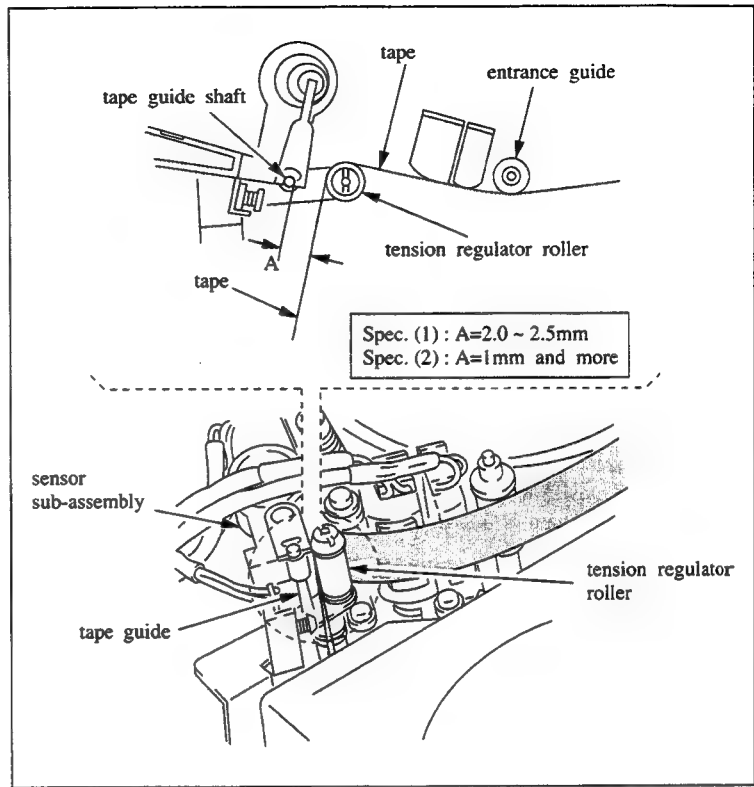
- (1) Put the switch S5 on SS-46P board in "SLACK MUTE ON" state.
- (2) Turn the POWER switch ON.
- (3) Insert a cassette tape without lid (BCT-30M).

**Note:** Place a weight on top of the cassette tape to prevent the tape it from coming up.

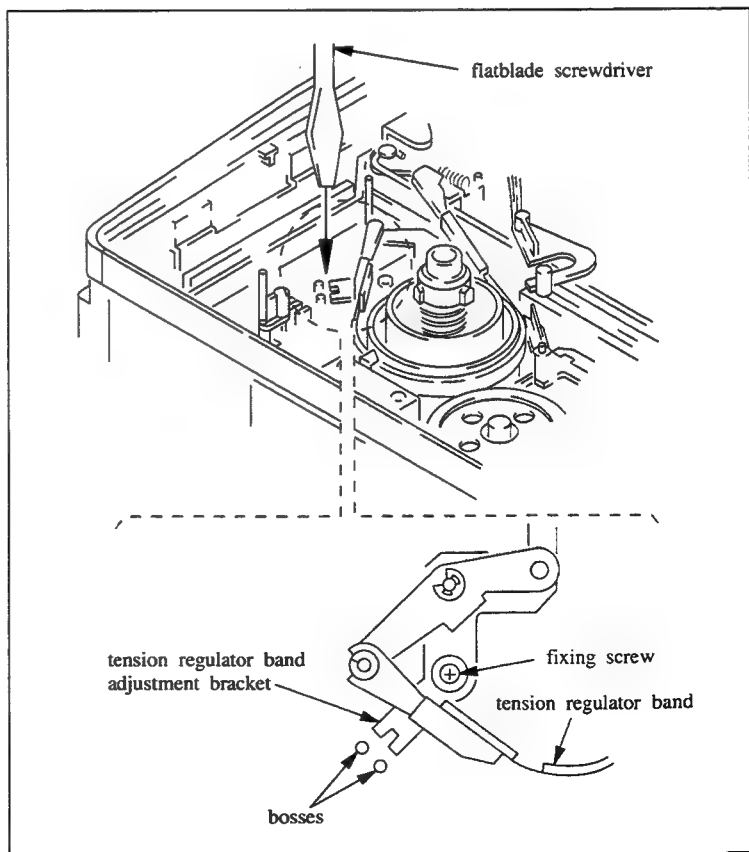
- (4) Put the unit into the F.FWD mode, and advance the tape for about 27 minutes from tape beginning (near the end of the tape.)
- (5) Put the unit into PLAY mode.
- (6) Visually check the clearance between the tape at the tension regulator roller and the tape guide of the sensor sub-assembly, and make sure that it satisfies the required specification (1).

If the specification (1) is satisfied, perform sub-step (14) and later.

If the specification (1) is not satisfied, perform sub-step (7) and later.



- (7) Press the EJECT button, and after the unit put into the unthread end mode, remove the cassette tape.
- (8) Turn the POWER switch OFF.
- (9) As shown in the figure, loosen a screw holding a tension regulator band adjustment bracket by 1/3 to 1/2 turn.

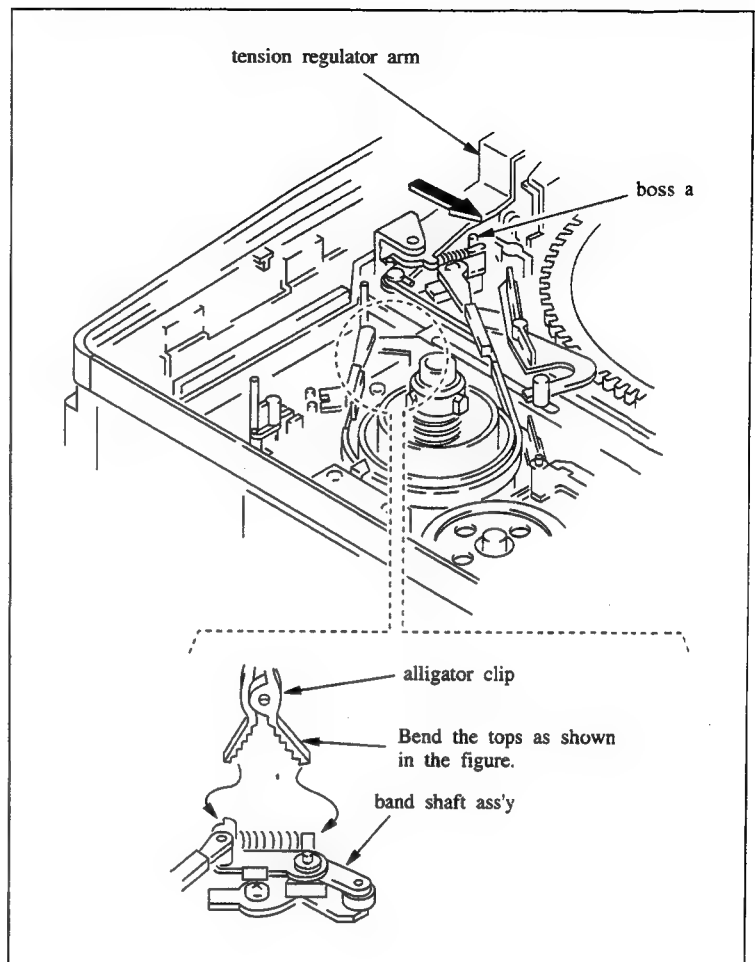




- (10) Use the manual gear to put the unit into PLAY mode. (Refer to Section 3-1.)
- (11) Press the tension regulator arm lightly toward the drum with finger, and press lightly against the boss "a" of the tension regulator. Keep holding the unit in this condition, insert a 3mm dia. flatblade screwdriver between the notch of the tension regulator band adjustment bracket, and the bosses of the chassis. In this condition, clip a band shaft assembly with an alligator clip as shown in the figure. (Before performing this step, reform the alligator clip as shown in the figure.) Adjust the clearance between the tension regulator roller and tape guide of the sensor sub-assembly with flatblade screwdriver.
  - At sub-step (6), if the clearance is narrower than the specification 1, turn the screwdriver in the counterclockwise direction.
  - At sub-step (6), if the clearance is wider than the specification 1, turn the screwdriver in the clockwise direction.
- (12) Tighten a screw of the tension regulator band adjustment bracket.
- (13) After adjustment, repeat all sub-steps from (1), and make sure that the required specification 1 is satisfied. Repeat the adjustment procedures until the specification is satisfied.
- (14) Make sure that the band shaft assembly does not move, even if the tension regulator moves to the original position with finger.
- (15) Insert a cassette tape without lid (BCT-30M) and put the unit into REW mode, then stop the tape at a point about 3 minutes from the tape beginning (near the beginning of the tape).
- (16) Put the unit into PLAY mode.
- (17) Visually check the clearance between the tape at the tension regulator roller and tape guide of the sensor sub-assembly satisfies the required specification 2.
 

If the specification 2 is satisfied, perform step 12.

If the specification 2 is not satisfied, perform sub-step (7) and later and repeat adjustments until both specifications 1 and 2 are satisfied. After performing the adjustments, perform step 12.
- (18) After the adjustment, be sure to put switch S5 on SS-46P board in "SLACK MUTE OFF" state.



12. Perform the **pull-rod position adjustment**.

(1) Put the switch S5 on SS-46P board in "SLACK MUTE ON" state.

(2) Insert a cassette tape without lid (BCT-30M).

**Note:** Place a weight on top of the cassette tape to prevent the tape from coming up.

(3) Put the unit into F.FWD mode and advance the tape for about 27 minutes from tape beginning (near the end of the tape).

(4) Put the unit into PLAY mode.

(5) Memorize the position of the tension regulator roller relative to the sensor sub-assembly.

(6) Press the EJECT button and remove the cassette tape.

(7) Put the unit into PLAY mode without cassette tape. (Refer to Section 3-1.)

(8) Push the tension regulator arm with finger, and move it to the position you memorized in sub-step (5). In this condition, make sure that the clearance between the power link arm and tension regulator boss "b" (as shown in figure) satisfies the required specification 3.

If the specification is satisfied, perform sub-step (13) and later.

If the specification is not satisfied, perform sub-step (9) and later.

(9) As shown in the figure, loosen a screw holding the pull-rod adjustment bracket by 1/3 to 1/2 turn.

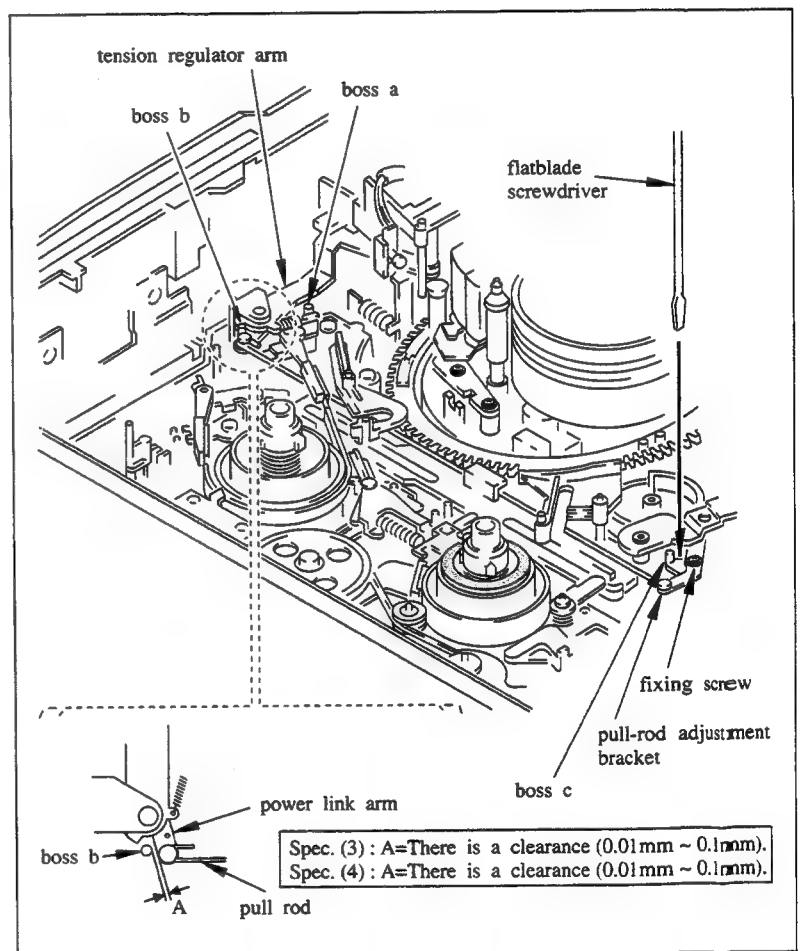
(10) Push the tension regulator arm gently with finger so that it touches the boss "a" of the tension regulator.

In this condition, insert a 3mm dia. flatblade screwdriver between the pull-rod adjustment bracket and the boss "c" shown in the figure, and turn the screwdriver either clockwise or counterclockwise to set the position of the adjustment bracket.

- At sub-step (8), if the clearance was narrower than the specification 3, turn the screwdriver in the counterclockwise direction.

- At sub-step (8), if the clearance was wider than the specification 3, turn the screwdriver in the clockwise direction.

(11) Securely tighten the screw that holding the pull-rod adjustment bracket.



- (12) After adjustment is completed, perform steps (4) and later, and make sure that the required specification 3 is satisfied. If the specification is not satisfied, repeat the adjustments.
- (13) Insert the cassette tape without lid (BCT-30M) and put the unit into REW mode, and rewind the tape for about 3 minutes from tape beginning.
- (14) Put the unit into PLAY mode.
- (15) Memorize the position of the tension regulator roller relative to the sensor sub-assembly.
- (16) Press the EJECT button and remove the cassette tape.
- (17) Put the unit into PLAY mode without cassette tape. (Refer to Section 3-1.)
- (18) Push the tension regulator arm with finger and move it to the position memorized in sub-step (15).

In this condition make sure that the clearance between the power link arm and tension regulator boss "b" (shown in the figure) satisfies the required specification 4.

If the specification 4 is satisfied, perform step 13.

If the specification 4 is not satisfied, perform sub-step (9) and later, until the required both specifications 3 and 4 are satisfied. After adjustment is completed, perform step 13.
- (19) After adjustment is completed, be sure to put switch S5 on SS-46P board in "SLACK MUTE OFF" state.

13. Perform the **FWD back tension adjustment**.

- (1) Insert a cassette tape without lid (BCT-30M), and forward/rewind it for about 3 minutes from the tape top (near beginning of the tape).

**Note:** Place a weight on top of the cassette tape to prevent the tape from coming up.

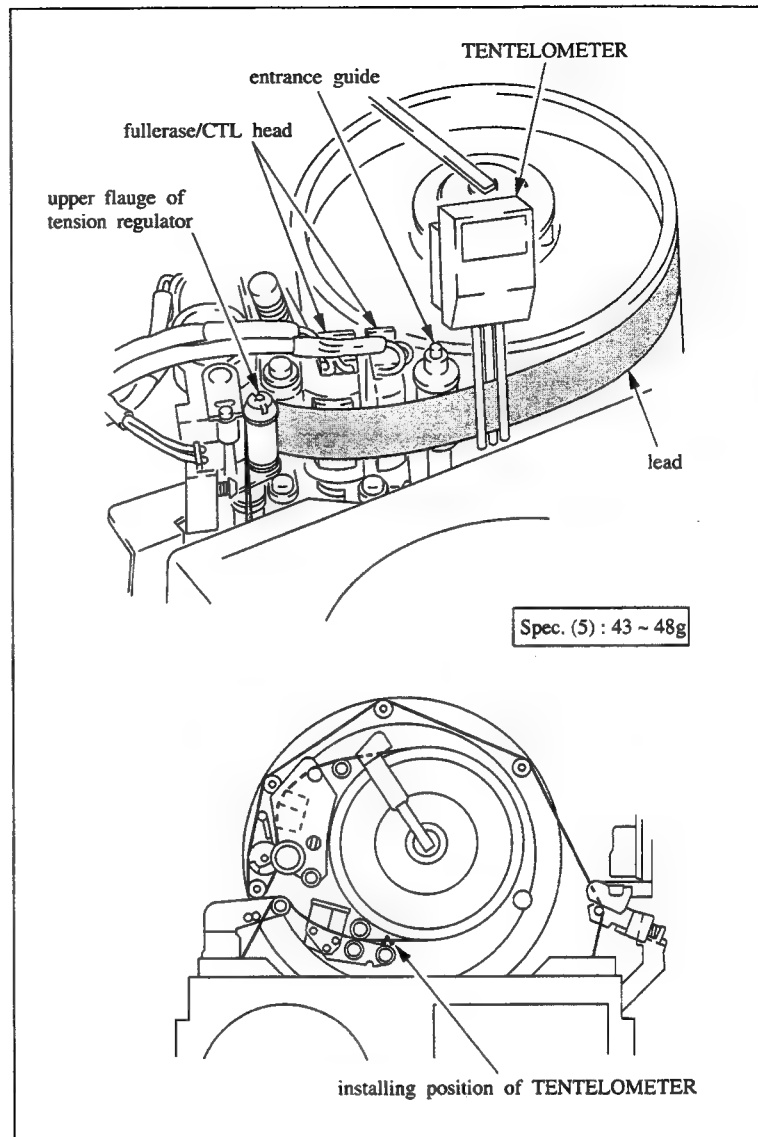
- (2) Put the unit into PLAY mode.
- (3) Hold the TENTELOMETER by hand, and set it as shown in the figure.

**Note 1:** Never contact the probe of the TENTELOMETER to the rotating drum.

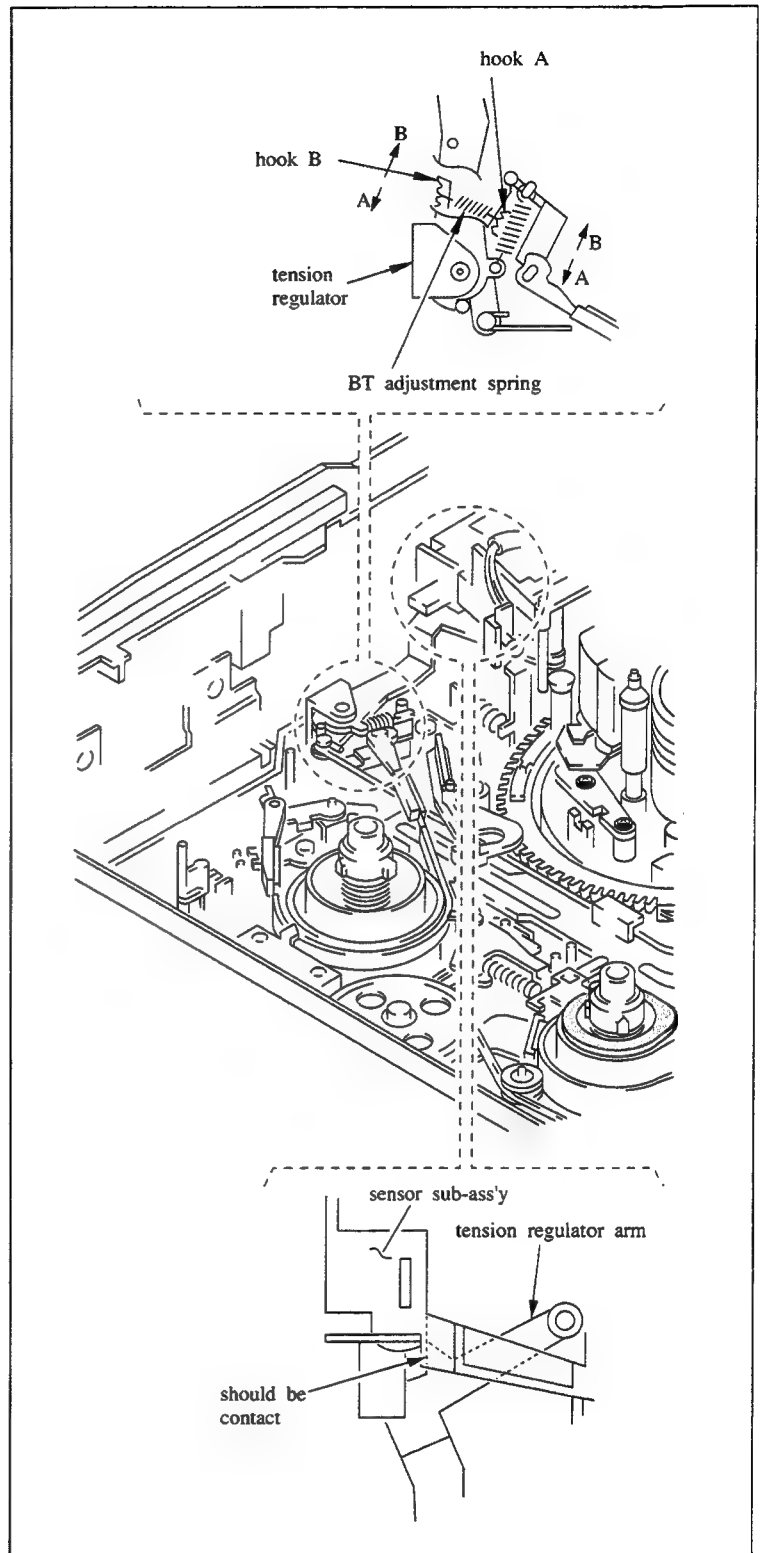
**Note 2:** Adjust the slantness of the TENTELOMETER so that the tape runs in contact with the lead of the drum and so that it does not curl at the guide flange of the entrance guide.

- (4) Make sure that the indicating value of the TENTELOMETER satisfies the required specification 5.

If the specification 5 is not satisfied, perform sub-step (5) and later.



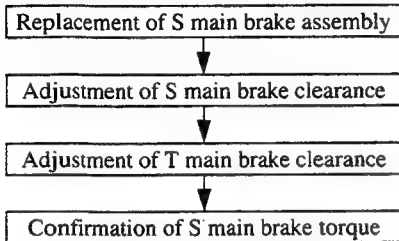
- (5) Change the hooks A and B for the back tension adjustment spring on the tension regulator are hooked.
    - If the indicating value is larger than the specification, move hook A or hook B in the direction of arrow "A".
    - If the indicating value is smaller than the specification, move hook A or hook B in the direction of arrow "B".
    - For each pitch of hook A is moved, the tension will change by 7-8 grams.
    - For each pitch of hook B is moved, the tension will change by 14-15 grams.
  - (6) After adjustment, make sure again that the required specification 5 is satisfied.
  - (7) After adjustment, put the unit into PLAY mode, and make sure that the tension regulator arm is in contact with the sensor sub-assembly. If it does not in contact, turn the pull-rod adjustment bracket in the counterclockwise direction until above mentioned specification is satisfied.
- After adjustment is completed, perform the tension regulator operating position adjustment.



### 3-9. S BRAKE SHOE REPLACEMENT

The S brake shoe is braked against the supply reel table when the unit is in the POWER OFF mode and STOP mode. When the POWER is turned ON and the unit is put into any mode other than STOP, the brake solenoid energized and the brake is released from the reel table.

#### Replacement flow chart



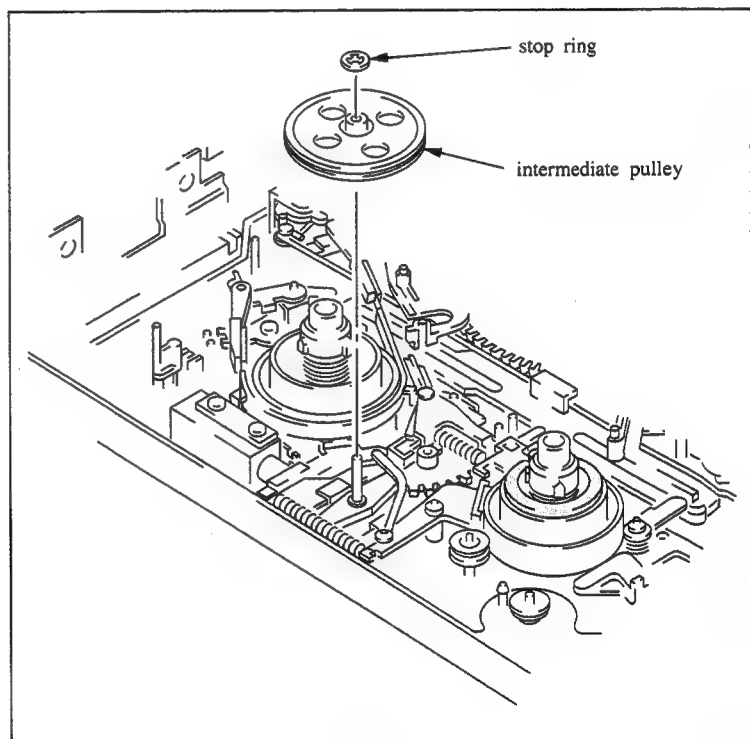
#### Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Reel table tension gauge	: J-6080-011-A
Tension scale (100g full scale)	: 7-732-050-30

#### Removal

1. Make sure that the unit is in the unthreading end mode. (Refer to Section 3-1.)
2. Remove a reel belt. (Refer to Section 3-5.)
3. Remove a stop ring above a intermediate pulley.
4. Remove the intermediate pulley.

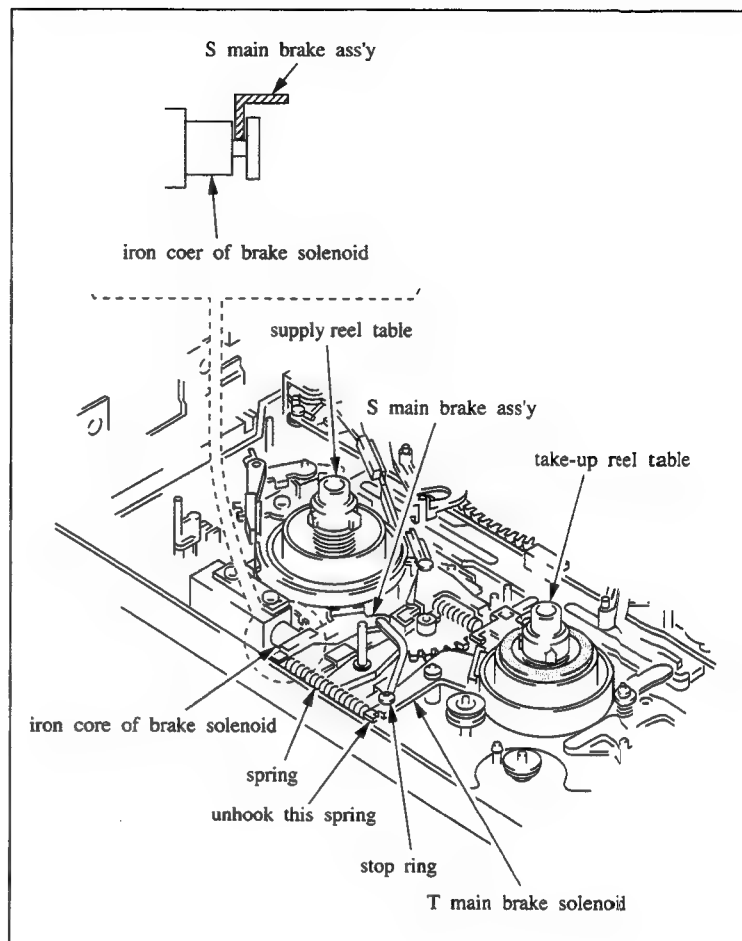
**Note:** A polyslider washer is installed at the lower part of the intermediate pulley. When the intermediate pulley is removed, the polyslider washer may detach together with the intermediate pulley. Replace it on the shaft.



5. Remove a stop ring of a T main brake assembly as shown in the figure.
6. Remove a stop ring of a S main brake assembly, and then remove the S main brake assembly.  
**Note:** When removing the S main brake assembly, take care not to damage a tension regulator band.
7. Unhook a spring attached to the S main brake assembly from the T main brake assembly.

#### Installation

8. Insert a new S main brake assembly onto the shaft. Make sure that the rib on the S main brake assembly fits into the groove on the iron core of a brake solenoid.  
**Note:** Pay particular attention not to cause damage to the tension regulator band when installing the S main brake assembly.
9. Hook the spring attached to the S main brake assembly onto the T main brake assembly.
10. Fasten the S main brake assembly onto the shaft using the stop ring.  
**Note:** In case the stop ring is deformed, be sure to replace it with a new one.  
 Part No.: 3-669-465-00
11. Use the stop ring to fasten the arm of the S main brake assembly to the shaft of the T main brake assembly.  
**Note:** In case the stop ring is deformed, be sure to replace it with a new one.  
 Part No.: 3-669-465-00
12. Insert the intermediate pulley onto the shaft and fasten it using the stop ring.  
**Note:** In case the stop ring is deformed, be sure to replace it with a new one.  
 Part No.: 3-669-465-00
13. Clean the surface of the reel belt with a cleaning piece moistened with cleaning fluid.
14. Install the reel belt. (Refer to Section 3-5.)



### Adjustments after replacement

#### 15. Perform the S main brake clearance adjustment.

- (1) Turn the POWER switch ON.
- (2) After confirming that the unit is in STOP mode, press the EJECT button and put the unit into the unthreading completion mode.

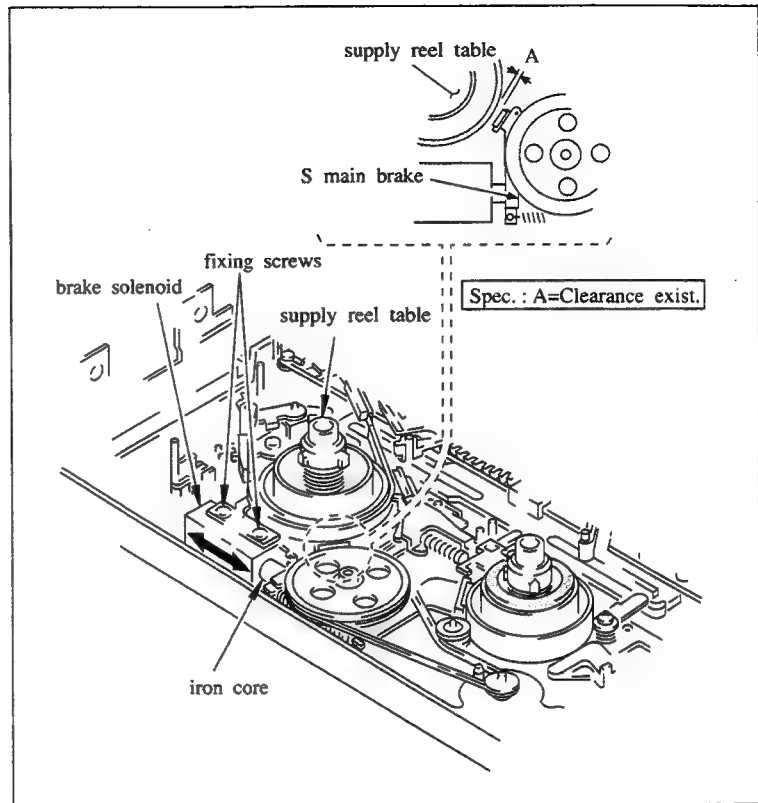
**Note:** Never turn POWER OFF even after the unthreading completion mode is performed.

- (3) Make sure that the clearance between the S main brake shoe and supply reel table satisfies the required specification.

If the specification is satisfied, perform step 16.

If the specification is not satisfied, loosen two screws of the brake solenoid by 1/2 to one turn, and move the solenoid in the direction shown by the arrow.

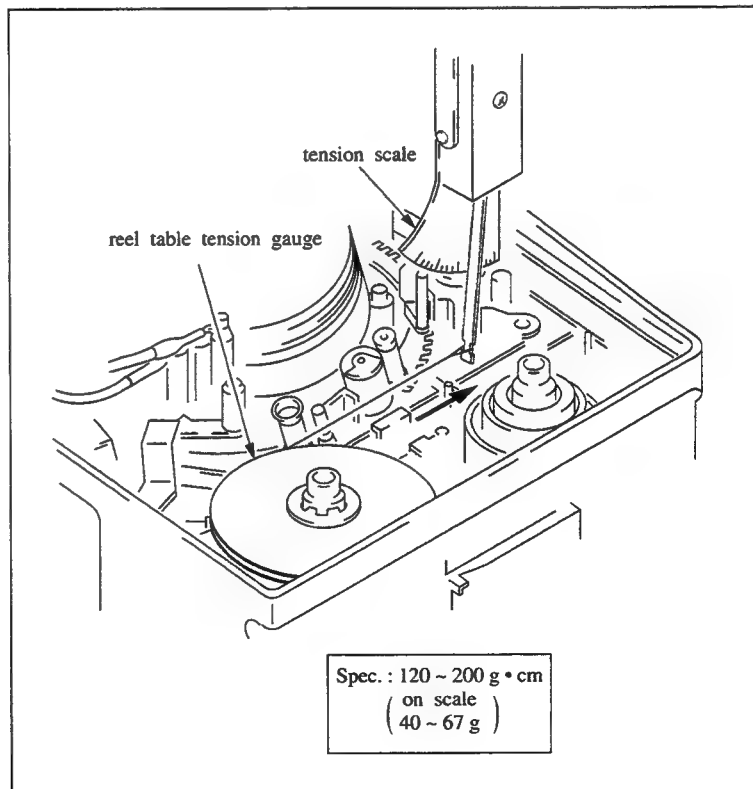
16. Perform the T main brake clearance adjustment. (Refer to Section 3-10.)



#### 17. Perform the S main brake torque check.

- (1) Put the unit into STOP mode, then turn the POWER switch OFF.
- (2) Wind the string onto the reel table tension gauge, in the clockwise direction.
- (3) Install the reel table tension gauge on the supply reel table, and hook a tension scale on an end of the string.
- (4) Move the tension scale in the arrow direction, and make sure the scale reading satisfies the required specification.

If the specification is not satisfied, clean the supply reel table surface contacted by the S main brake with a clearing piece moistened with cleaning fluid.

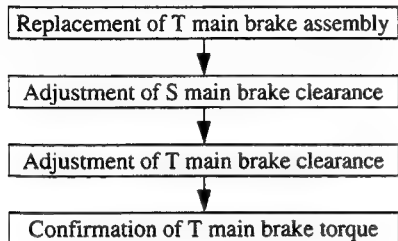




### 3-10. T BRAKE SHOE REPLACEMENT

The T brake shoe is braked against the take-up reel table when the unit is in the POWER OFF mode and STOP mode. When the POWER is turned ON and the unit is put into any mode other than STOP, the brake solenoid energized, and the brake is released from the reel table.

#### Replacement flow chart



#### Tools

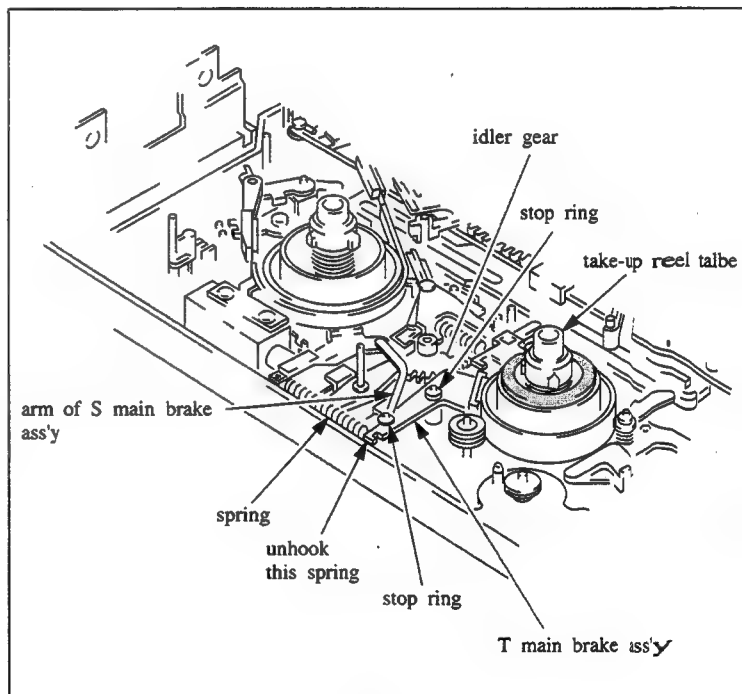
Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Wire clearance gauge	: J-6152-450-A
Reel table tension gauge	: J-6080-011-A
Tension scale (200g full scale)	: 7-732-050-30

#### Removal

1. Make sure that the unit is in the unthreading end mode. (Refer to Section 3-1.)
2. Remove a reel belt. (Refer to Section 3-5.)
3. Remove a stop ring above a intermediate pulley. (Refer to figure in Section 3-9.)
4. Remove the intermediate pulley.

**Note:** A polyslider washer is installed at the lower part of the intermediate pulley. When the intermediate pulley is removed, the polyslider washer may detach together with the intermediate pulley. Replace it on the shaft.

5. Remove a stop ring of an arm of a S main brake assembly, as shown in the figure.
6. Unhook a spring of the S main brake assembly from a T main brake assembly.
7. Remove a stop ring of the T main brake assembly, and then remove the T main brake assembly.



### Installation

8. Insert a new T main brake assembly onto the shaft, and fasten with the stop ring.

**Note:** In case the stop ring is deformed, be sure to replace it with a new one.

Part No.: 3-669-465-00

9. Hook the spring of the S main brake assembly onto the T main brake assembly.

10. Fasten the arm of the S main brake assembly to the T main brake assembly with the stop ring.

**Note:** In case the stop ring is deformed, be sure to replace it with a new one.

Part No.: 3-669-465-00

11. Insert the intermediate pulley onto the shaft and fasten it using the stop ring.

**Note:** In case the stop ring is deformed, be sure to replace it with a new one.

Part No.: 3-669-465-00

12. Clean the reel belt with a cleaning piece moistened with cleaning fluid.

13. Install the reel belt. (Refer to Section 3-5.)

### Adjustments after replacement

14. Perform the **T main brake clearance adjustment**.

- (1) Turn the POWER switch ON.

- (2) After confirming that the unit is in STOP mode, press the EJECT button and put the unit into the unthreading completion mode.

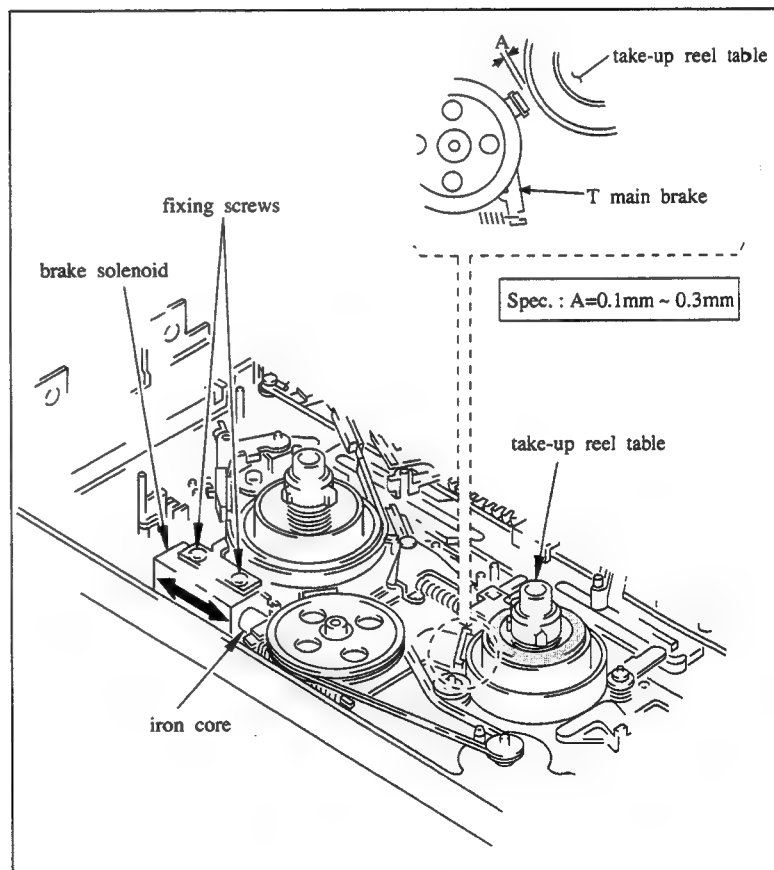
**Note:** Never turn POWER OFF even after the unthreading completion mode is performed.

- (3) Make sure that the clearance between the T main brake shoe and take-up reel table satisfies the required specification using the wire clearance gauge.

If the specification is satisfied, perform step 15.

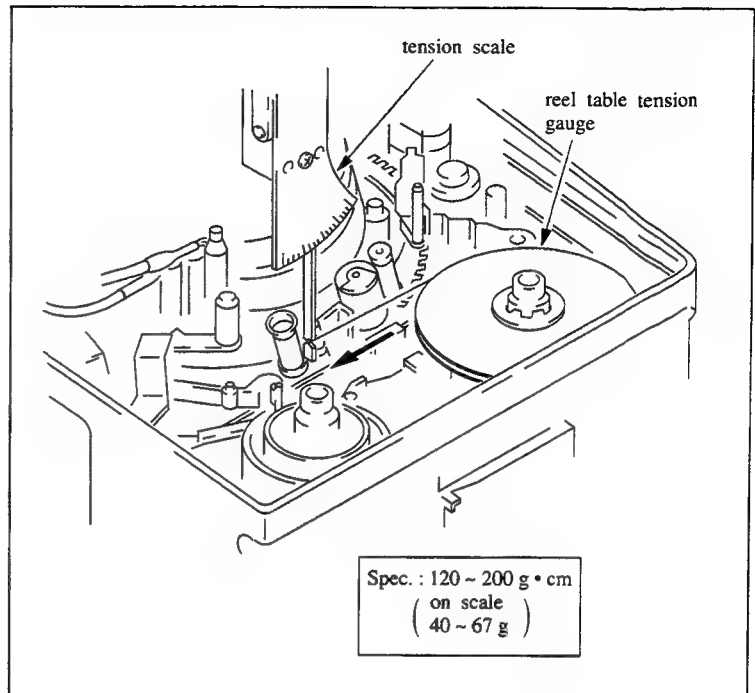
If the specification is not satisfied, loosen two screws of the brake solenoid by 1/2 to one turn, and move the solenoid in the direction shown by the arrow.

15. Perform the S main brake clearance adjustment. (Refer to Section 3-9.)



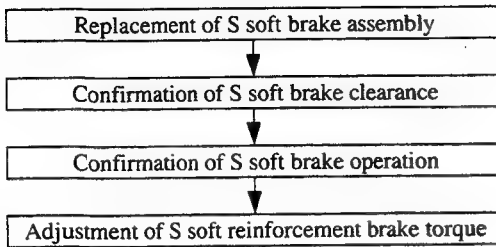
16. Perform the **T main brake torque check**.

- (1) Put the unit into STOP mode, then turn the POWER switch OFF.
- (2) Move the idler gear with finger so that it stays around center position between supply reel table and take-up reel table.
- (3) Wind the string onto the reel table tension gauge in the counterclockwise direction.
- (4) Install the reel table tension gauge on the take-up reel table, and hook a tension scale on an end of the string.
- (5) Move the tension scale in the arrow direction, and make sure that the scale reading meets the required specification.  
If the specification is not satisfied, clean the take-up reel table surface contacted by the T main brake with a cleaning piece moistened with cleaning fluid.



### 3-11. S SOFT BRAKE SHOE REPLACEMENT

#### Replacement flow chart

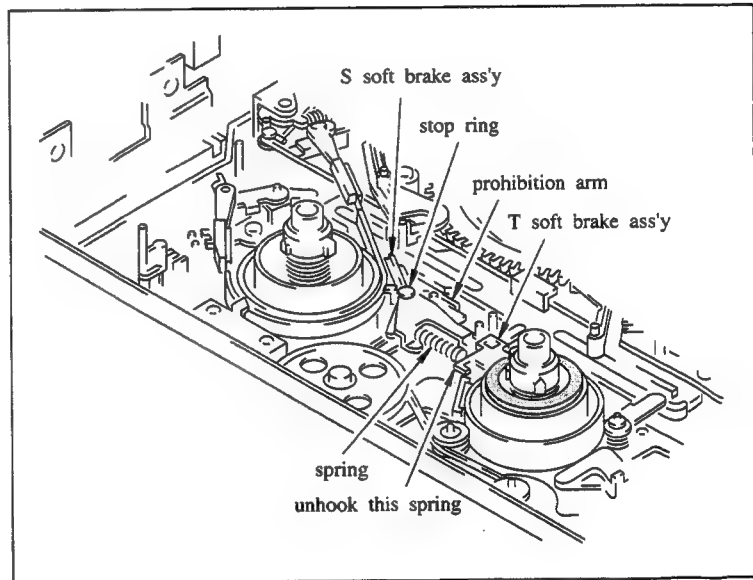


#### Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Wire clearance gauge	: J-6152-450-A
Reel table tension gauge	: J-6080-011-A
Tension scale (100g full scale)	: 7-732-050-30
Cassette tape without lid (BCT-30M):	
(Refer to Section 3-1)	

#### Removal

1. Make sure that the unit is in the unthreading end mode. (Refer Section 3-1.)
2. Unhook a spring attached to a T soft brake assembly.
3. Remove a stop ring of the T soft brake assembly, and then remove the T soft brake assembly.
4. Remove a stop ring of a S soft brake assembly, and then remove the S soft brake assembly. Remove the prohibition arm at the same time.  
**Note:** When removing the S soft brake assembly, take care not to damage a tension regulator band.
5. Unhook the prohibition arm spring from the removed S soft brake assembly.
6. Disassemble the prohibition arm from the S soft brake assembly.



### Installation

7. Assemble a new S soft brake assembly with prohibition arm as shown in the figure, and hook the prohibiting arm spring to the S soft brake assembly.

8. Insert the assembled S soft brake assembly onto the shaft, and fasten it with the stop ring.

**Note 1:** When installing the assembly, pay particular attention not to cause damage to the tension regulator band.

**Note 2:** In case the stop ring is deformed, be sure to replace it with a new one.

Part No.: 3-669-465-00

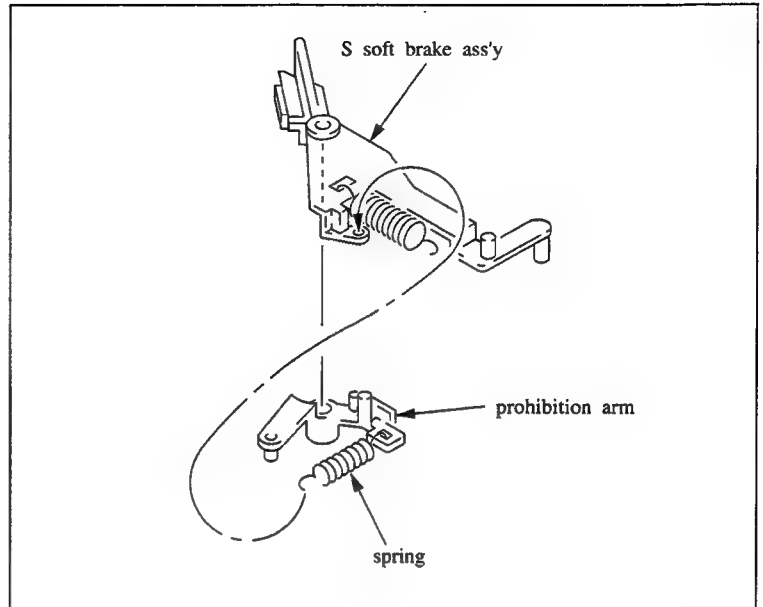
**Note 3:** Install the band holder of the S soft brake assembly so as to hold down the tension regulator band.

9. Assemble the T soft brake assembly and fasten it with the stop ring.

**Note:** In case the stop ring is deformed, be sure to replace it with a new one.

Part No.: 3-669-465-00

10. Hook the spring of the S soft brake assembly onto the T soft brake assembly.



### Adjustments after replacement

#### 11. Perform the **S soft brake clearance adjustment**.

- (1) Put the unit into the threading end mode.  
(Refer to Section 3-1.)
- (2) Turn the POWER switch OFF, then rotate the manual gear in the clockwise direction, setting the unit to PLAY mode using a 2 mm dia. Philips type screwdriver.
- (3) Push a tension regulator arm gently with finger in the direction of the reel table, and release the tension regulator band from the supply reel table (this is done in order to facilitate the check in the following step).
- (4) Make sure that the narrowest point of clearance between the S soft brake shoe and supply reel table satisfies the required specification using a wire clearance gauge.

If the specification is satisfied, perform step 12 and later.

If the specification is not satisfied, make sure whether there was some error in assembly of the S soft brake.

If there was no error in assembly, replace the S soft brake assembly once more with a new one.

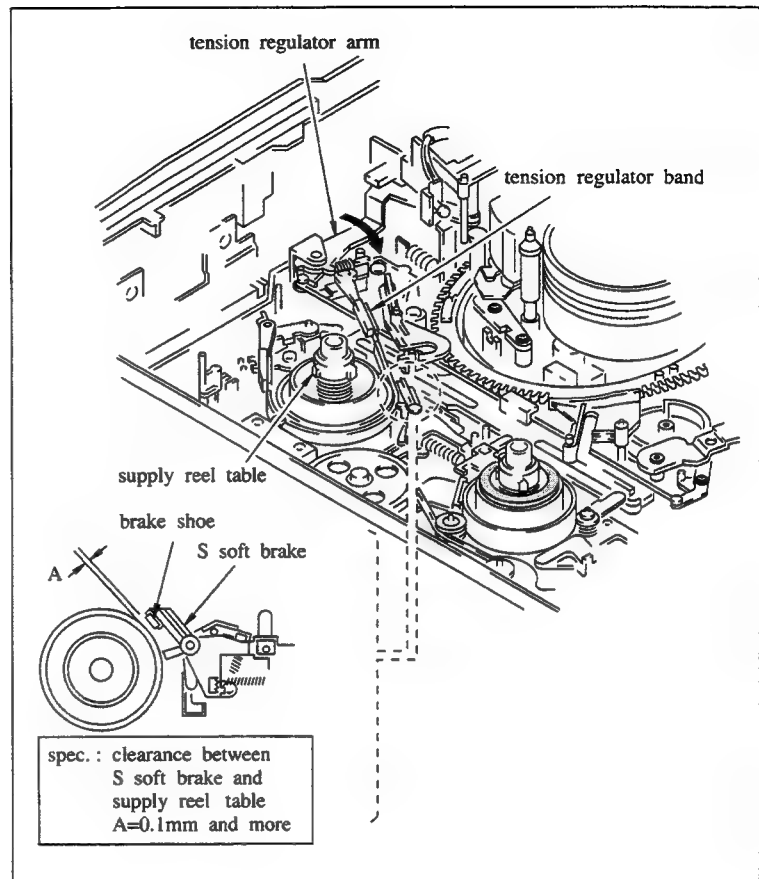
#### 12. Perform the **S soft brake operation check**.

- (1) Insert a cassette tape without lid (BCT-30M), and lightly press down the top with hand.
- (2) Put the unit into REW mode. and rewind the tape to its beginning.
- (3) Put the unit into F.FWD mode for about 10 seconds, then press the STOP button. At this time, make sure that the following specifications are satisfied.

**Specification 1:** When in F.FWD mode, no cyclic tape slackness occurs between the supply side of the cassette tape and the tension regulator.

**Specification 2:** When in F.FWD mode, no cyclic vibration of the tension regulator guide occurs.

**Specification 3:** When just put into STOP mode, no tape slackness occurs around the tension regulator.



**Specification 4:** When just put into STOP mode, the tension regulator arm does not vibrate unnaturally.

If all the specifications are satisfied, perform step 13.

If the specification are not satisfied, make sure whether there was some error in assembly of the S soft brake, particularly in the way the spring is hooked correctly.

- (4) Press the EJECT button and remove the cassette tape.

**13. Perform the S soft reinforcement brake torque adjustment.**

- (1) Make sure that the unit is in the unthreading completion mode, then turn the POWER switch OFF.
- (2) Wind the string onto the reel table tension gauge in the clockwise direction.
- (3) Install the reel table tension gauge on the supply reel table, and hook a tension scale on an end of the string.
- (4) Push the iron core of a brake solenoid in the energized direction using a 2 mm dia. flatblade screwdriver so as to release the braking of the S main brake against the supply reel table.

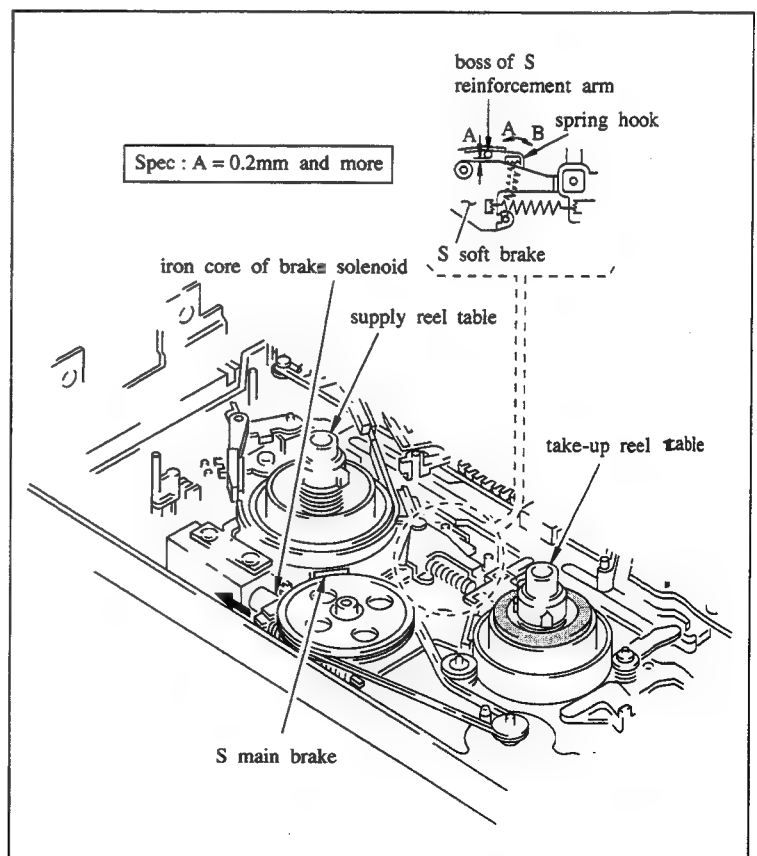
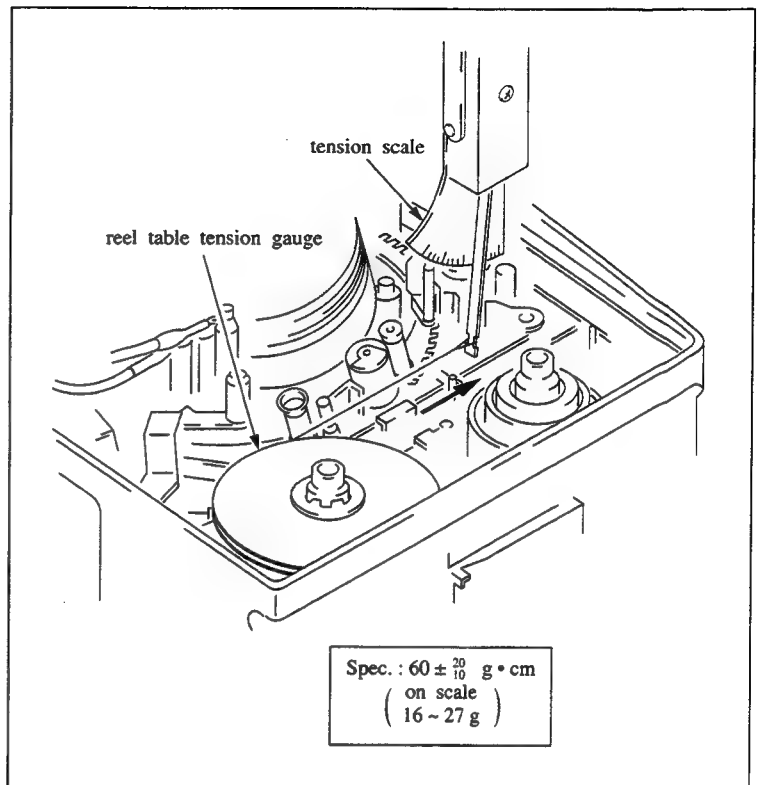
Keeping in this condition, move the tension scale in the direction of the arrow. Make sure that the scale reading satisfies the required specification.

If the specification is not satisfied, change the position of the spring as shown in the figure.

If the scale reading is larger than the specification, move hook in the direction of arrow A.

If the scale reading is smaller than the specification, move hook in the direction of arrow B.

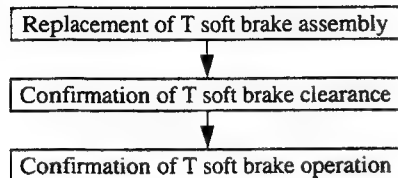
- (5) In the condition of sub-step (4), make sure that the clearance exists between the boss of the S soft reinforcement brake arm and S soft brake.



### 3-12. T SOFT BRAKE SHOE REPLACEMENT

T soft brake operates as the back tension during threading operation and REW operation.

#### Replacement flow chart



#### Tools

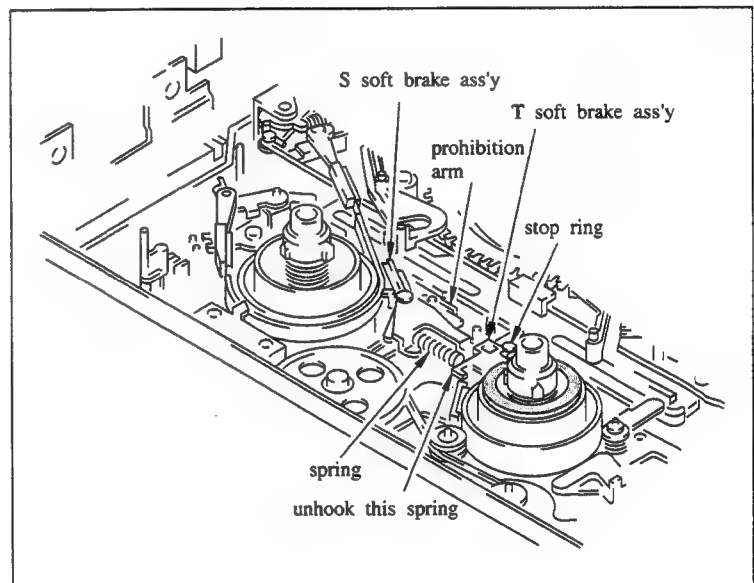
Wire clearance gauge : J-6152-450-A  
Cassette tape without lid (BCT-30M):  
(Refer to Section 3-1)

#### Removal

1. Make sure that the unit is in the unthreading end mode. (Refer to Section 3-1.)
2. Unhook the spring of a S soft brake assembly from a T soft brake assembly.
3. Remove a stop ring of the T soft brake assembly, and remove the T soft brake assembly.

#### Installation

4. Insert a new T soft brake assembly onto the shaft, and fasten it with a stop ring.  
**Note:** In case the stop ring is deformed, be sure to replace it with a new one.  
Part No.: 3-669-465-00
5. Hook the spring of the S soft brake assembly to the T soft brake assembly.





### Adjustments after replacement

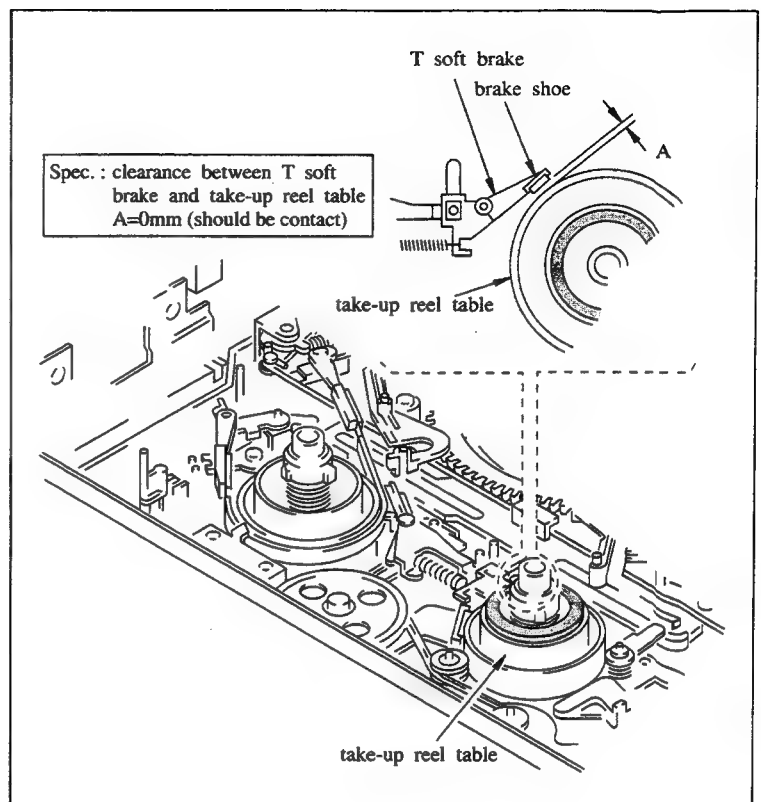
#### 6. Perform the **T soft brake clearance check**.

- (1) Put the unit into the threading end mode.  
(Refer to Section 3-1).
- (2) Turn OFF the POWER switch, rotate the manual gear in the clockwise direction, using a 2 mm dia. philips type screwdriver, setting the unit into PLAY mode.
- (3) Make sure that the clearance between the T soft brake shoe and take-up reel table satisfies the required specification using a wire clearance gauge.

If the specification is satisfied, perform step 7.

If the specification is not satisfied, make sure whether there was some error in assembly of the T soft brake.

If there was no error in assembly, replace the T soft brake assembly once more with a new one.



7. Perform the **T soft brake operation check**.

- (1) Insert a cassette tape without lid (BCT-30M), and lightly press down the top with hand.
- (2) Put the unit into the F.FWD mode and wind the tape to its end.
- (3) Put the unit into the REW mode for about 10 seconds, then press the STOP button. At this time, make sure that the following specifications are satisfied.

**Specification 1:** When in REW mode, no cyclic tape slackness occurs between the take-up side of the cassette tape and slantness guide.

**Specification 2:** When just put into STOP mode, no tape slackness occurs around the take-up side of the cassette tape.

**Specification 3:** Stand the unit keeping a connector box down. Perform sub-steps (1) through (3), and make sure that the specifications 1 and 2 are satisfied.

If the specifications are not satisfied, change the position of the spring of the T soft brake.

- (4) Press the EJECT button, and remove the cassette tape.
- (5) Insert the cassette tape removed in sub-step (4), and threading again. Make sure that the following specifications are satisfied.

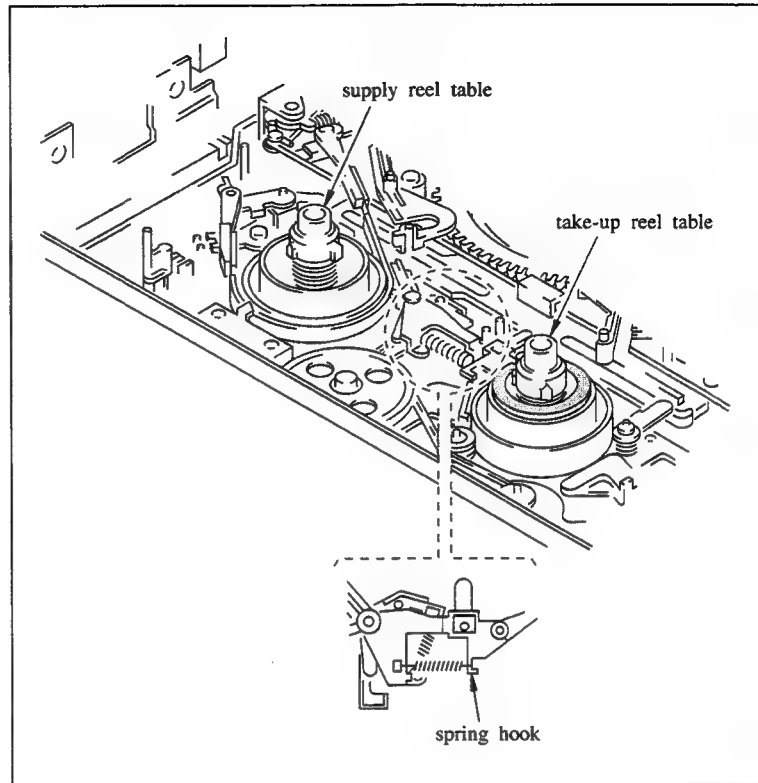
**Specification 4:** During threading, no tape slackness occurs around the tape exit side (take-up reel side) of the cassette tape.

**Specification 5:** Just after the threading completion, no tape slackness occurs around the tape exit side (take-up reel side) of the cassette tape.

**Specification 6:** Stand the unit keeping a connector box down. Perform sub-step (5), and make sure that the specifications 4 and 5 are satisfied.

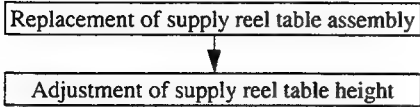
If the specifications are not satisfied, adjust the position of the T soft brake until all specifications 1 through 6 are satisfied.

- (6) Press the EJECT button and remove the cassette tape.



### 3-13. SUPPLY REEL TABLE ASSEMBLY REPLACEMENT

#### Replacement flow chart



#### Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Oil	: 7-661-018-18
Cassette reference plate	: J-6080-008-A

#### Removal

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Remove a stop ring on the upper part of a supply reel table using a pair of fine tweezers.
3. Remove the supply reel table.

**Note 1:** Be careful not to lose steel washer and polyslider washer at the lower part of reel table when the reel table is removed. They may detach together with the reel table.

**Note 2:** If in case steel washer and polyslider washer are detached, install them to the reel shaft in the order shown in the figure.

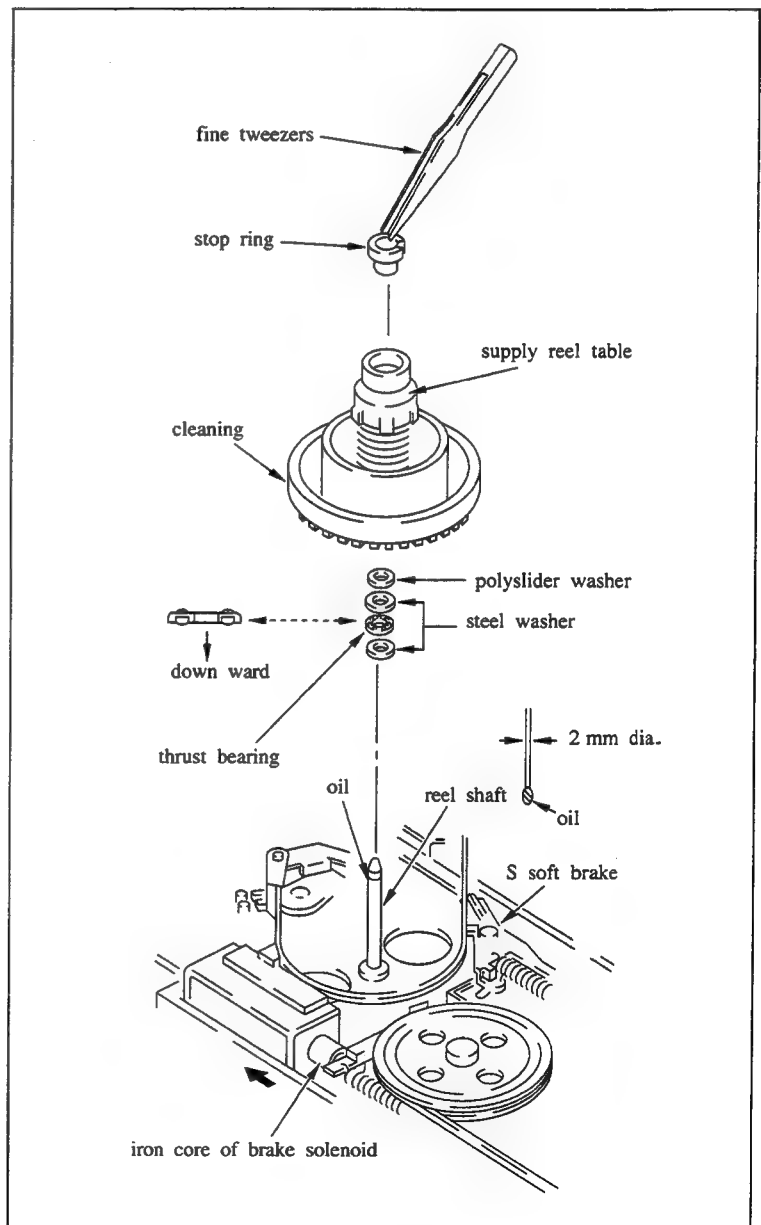
#### Installation

4. Clean the reel shaft and the circumference of a new reel table with a cleaning piece moistened with cleaning fluid.
5. Apply a drop of oil to the reel shaft on the position shown in the figure.

**Note:** A drop of oil means the volume attached to the tip of stick with diameter of about 2 mm as more or less shown in the figure.

6. While putting the iron core of the brake solenoid in energized position using tweezers etc. to release the main brake, install the supply reel table to the reel shaft.

**Note:** Be carefull not to bend or cause damage to the tension regulator band when installing the supply reel table.



### Adjustment after replacement

#### 7. Perform the supply reel table height adjustment.

- (1) Clean both surfaces of the cassette reference plate with a cleaning piece moistened with cleaning fluid.
- (2) Clean the surface of gauge in the same manner. This gauge is used to check the height of reel table.
- (3) Place the cassette reference plate on four cassette pillars.
- (4) Place a gauge on the cassette reference plate as shown in the figure, and move it toward the supply reel table.
- (5) Make sure that passing side of the gauge runs over the flanges on the reel table, as shown in the figure, while no passing side of the gauge is blocked at the flanges on the reel table. If above specifications are satisfied, perform step 8. If above specifications are not satisfied, perform sub-step 6 and later.
- (6) Only in case the specifications are not satisfied, perform this adjustment.

1) Remove the reel table from the reel shaft.

2) Adjust the height of reel table with polyslider washer installed under the reel table.

**Note 1:** Make sure to install at least one polyslider washer under the reel table.

**Note 2:** In case 2 or more of polyslider washers of different thickness are used, install the thicker washer on the top.

Polyslider washer for adjustment use  
3 mm dia. 0.13 mm thick

Part No. 3-701-439-01

3 mm dia. 0.25 mm thick

Parts No. 3-701-439-11

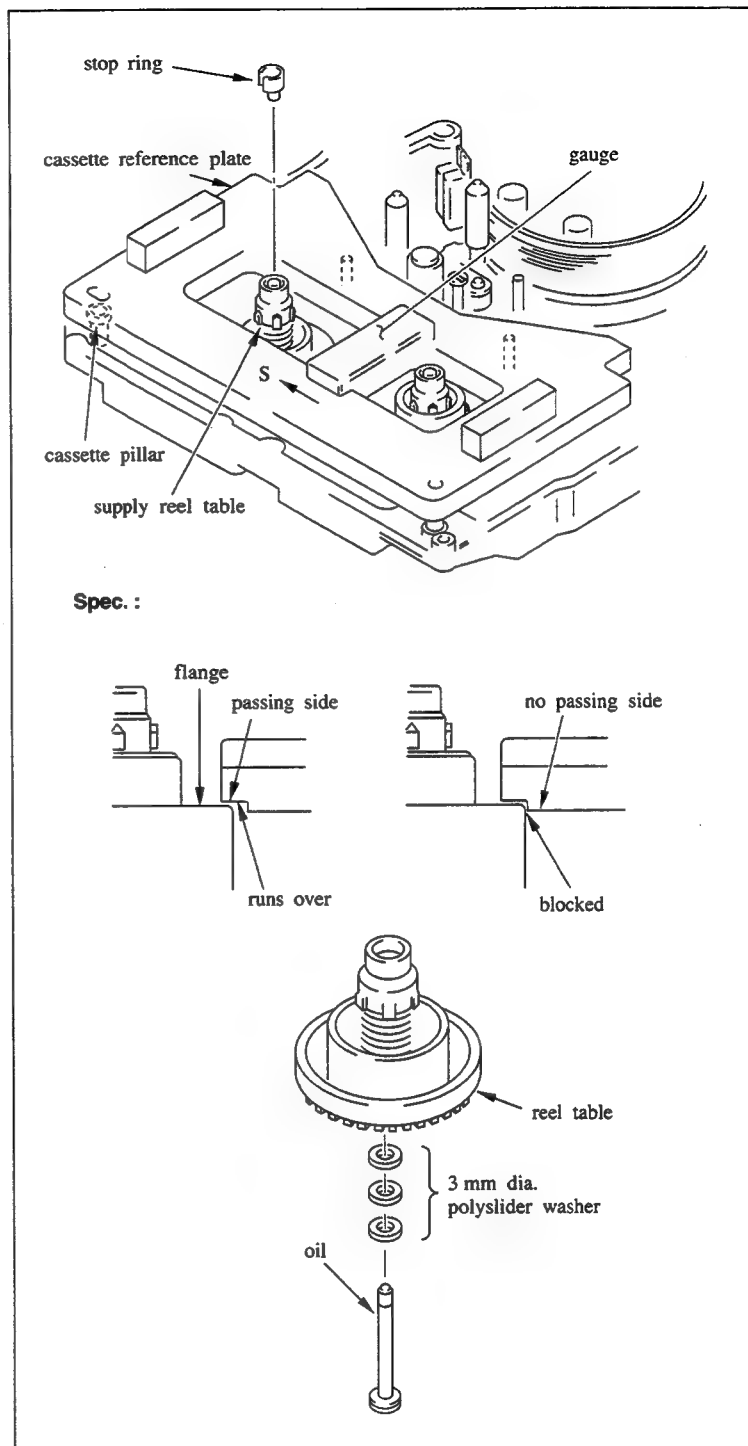
3 mm dia. 0.5 mm thick

Parts No. 3-701-439-21

3) In case of removing polyslider washer from or of adding it to the reel shaft, apply a drop of oil to the reel shaft on the position shown in the figure.

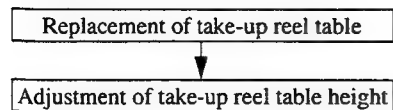
4) Install the supply table to the reel shaft once again, and make sure the required specifications are satisfied.

8. Install the supply reel table to the reel shaft with the stop ring.



### 3-14. TAKE-UP REEL TABLE ASSEMBLY REPLACEMENT

#### Replacement flow chart



#### Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Oil	: 7-661-018-18
Cassette reference plate	: J-6080-008-A

#### Removal

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Remove a stop ring on the upper part of a take-up reel table using a pair of fine tweezers.
3. Remove the take-up reel table.

**Note 1:** Be careful not to lose steel washer and polyslider washer at the lower part of the reel table when the reel table is removed. They may detach together with the reel table.

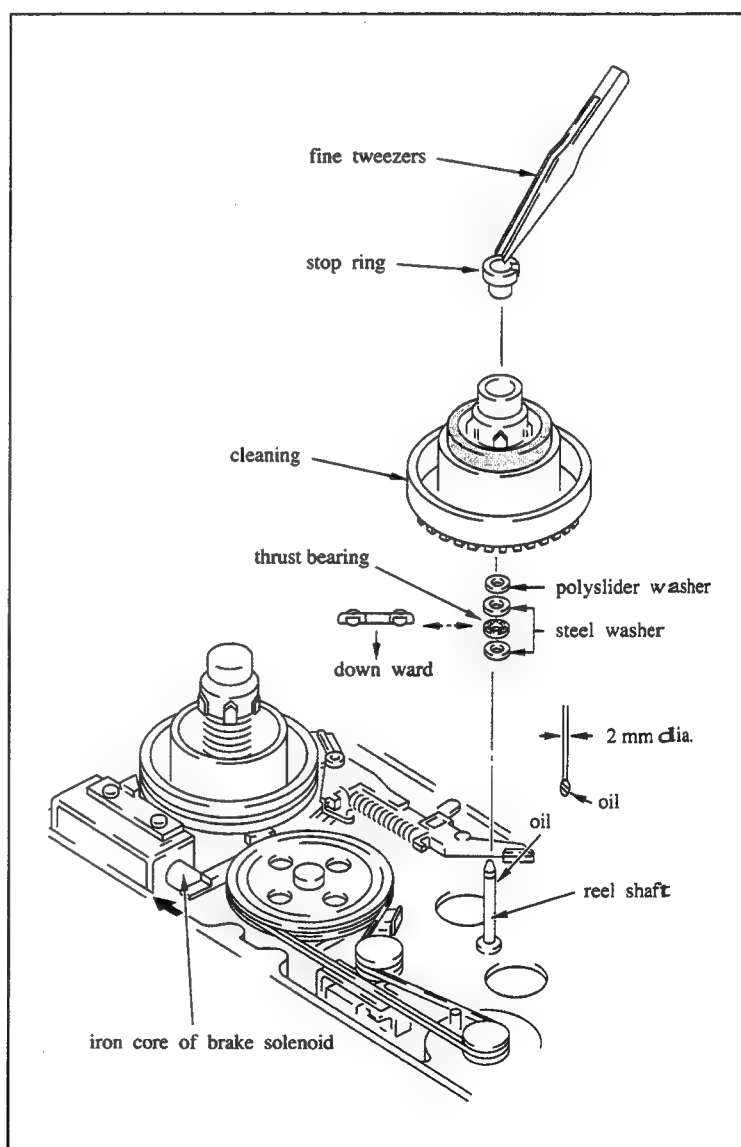
**Note 2:** If in case steel washer and polyslider washer are detached, install them to the reel shaft in the order shown in the figure.

#### Installation

4. Clean the reel shaft and the circumference of reel table with a cleaning piece moistened with cleaning fluid.
5. Apply a drop of oil to the reel shaft on the position indicated in the figure.

**Note:** A drop of oil means the volume attached to the tip of stick with diameter of about 2 mm as more or less shown in the figure.

6. While putting the iron core of the brake solenoid in-energized position with the tweezers etc. to release the main brake, install the take-up reel table to the reel shaft.



### Adjustment after replacement

#### 7. Perform the take-up reel table height adjustment.

- (1) Clean both surfaces of the cassette reference plate with a cleaning piece moistened with cleaning fluid.
- (2) Clean surface of gauge in the same manner. This gauge is used to check the height of reel table.
- (3) Place the cassette reference plate on four cassette pillars.
- (4) Place the gauge on the cassette reference plate as shown in the figure, and move it toward the take-up reel table.
- (5) Make sure that passing side of the gauge runs over the flanges on the reel table, as shown in the figure, while no passing side of the gauge is blocked at the flanges of the reel table.

If above specifications are satisfied, perform step 8.

If above specifications are not satisfied, perform sub-step 6 and later.

- (6) Only in the case the specifications are not satisfied, perform this adjustment.

- 1) Remove the reel table from the reel shaft.
- 2) Adjust the height of reel table with polyslider washer installed under the reel table.

**Note 1:** Make sure to install at least one polyslider washer under the reel table.

**Note 2:** In case two or more polyslider washers of different thickness are used, install the thicker one on the top.

Polyslider washer for adjustment use:

3 mm dia. 0.13 mm thick

Parts No. 3-701-439-01

3 mm dia. 0.25 mm thick

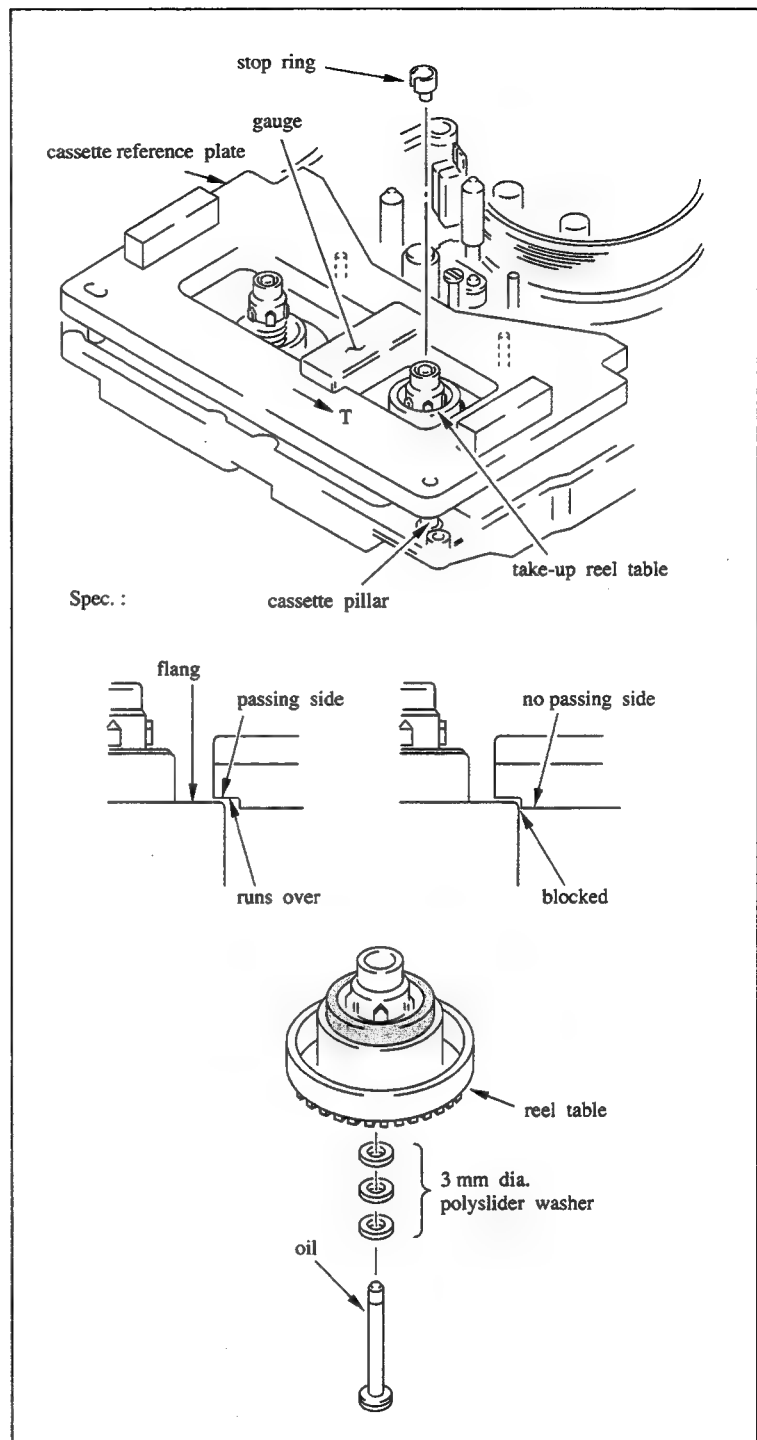
Parts No. 3-701-439-11

3 mm dia. 0.5 mm thick

Parts No. 3-701-439-21

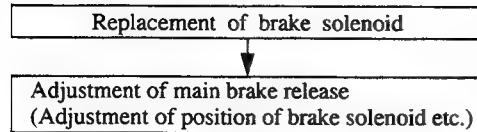
- 3) In case of removing the polyslider washer from or of adding it to the reel shaft, apply a drop of oil to the reel shaft on the position shown in the figure.
- 4) Install the take-up reel table to the reel shaft once again, and make sure the required specifications are satisfied.

8. Install the take-up reel table to the reel shaft with the stop ring.



### 3-15. BRAKE SOLENOID REPLACEMENT

#### Replacement flow chart



#### Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Wire clearance gauge	: J-6152-450-A

#### Removal

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Open a side panel. (Refer to Section 1-12.)
3. Open V0-34P board. (Refer to Section 1-13.)
4. Place the unit keeping a VR lid side down.
5. Remove six screws which are fixing SS-46P board.

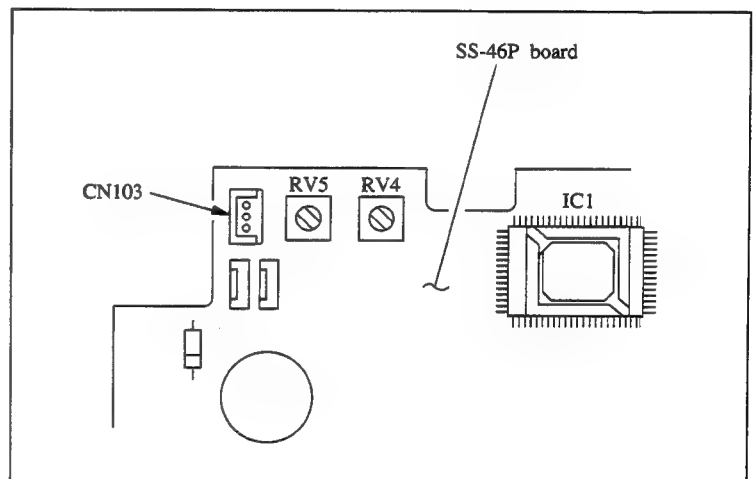
**Note:** Be careful not to drop the screws inside of the unit.

6. Disconnect the connector CN103 of SS-46P board.
7. Close V0-34P board and the side pannel tentatively.

**Note:** No screwing is required.

8. Place the unit keeping the side panel down.
9. Remove a reel belt and a intermediate pulley. (Refer to Section 3-9.)
10. Remove a stop ring which is holding a supply main brake assembly, and remove the supply main brake assembly.

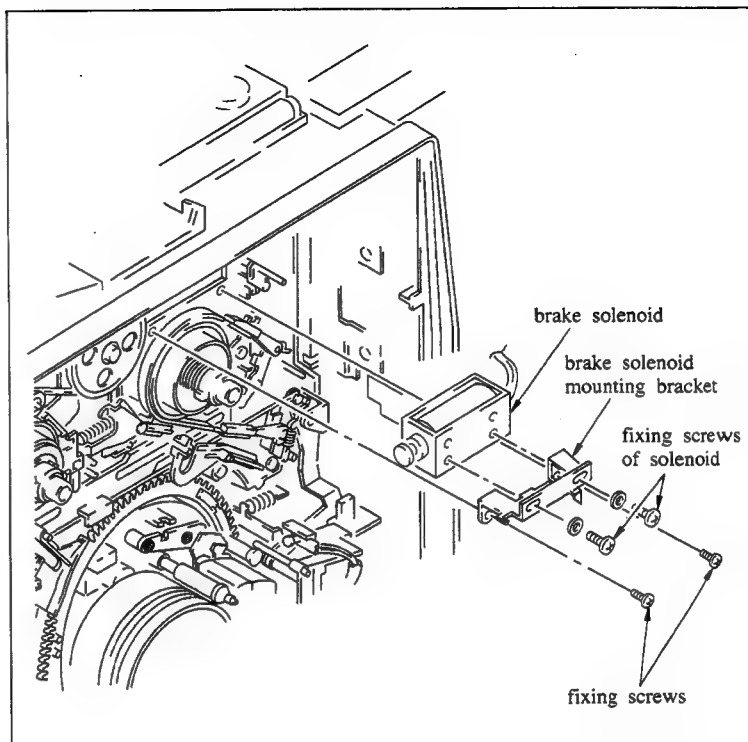
**Note:** Be careful not to cause damage to a tension regulator band when removing the supply main brake assembly.



11. Remove two screws which is fixing a brake solenoid mounting bracket to the chassis.
12. Stand the unit keeping the connector box down.
13. Open the side panel and VO-34P board.
14. Slide SS-46P board manually toward a capstan motor.
15. Remove the brake solenoid mounting bracket with the solenoid attached from the unit.  
Then, remove the harness attached with connector of the solenoid through the square hole of the chassis.

**Note:** Be careful not to cause damage to the tension regulator band when the brake solenoid mounting bracket are taken off.

16. Remove two screws which is fixing the solenoid to brake solenoid mounting bracket, remove the solenoid.





### Installation

17. Install a new solenoid to the brake solenoid mounting bracket.
18. Thread the harness with connector of the solenoid through the square hole of the chassis. Then pull its tip on SS-46P board.
19. Close V0-34P board and the side panel tentatively.

**Note:** No screwing is required.

20. Place the unit keeping the side panel down.
21. Install the brake solenoid mounting bracket to the chassis.

**Note:** Be careful not to cause damage to the tension regulator band.

22. Place the supply main brake assembly on the shaft.

The rib of the supply main brake assembly must be placed at the groove of an iron core of the brake solenoid. (Refer to Section 3-9.)

**Note:** Be careful not to cause damage to the tension regulator band.

23. Secure the supply main brake assembly on the shaft with the stop ring.

**Note:** In case the stop ring is deformed, be sure to replace it with a new one.

Parts No. 3-669-465-00

24. Place the unit keeping the VR lid down.

25. Install SS-46P board with six screws.

**Note:** Be carefull not to drop the screws inside of the unit.

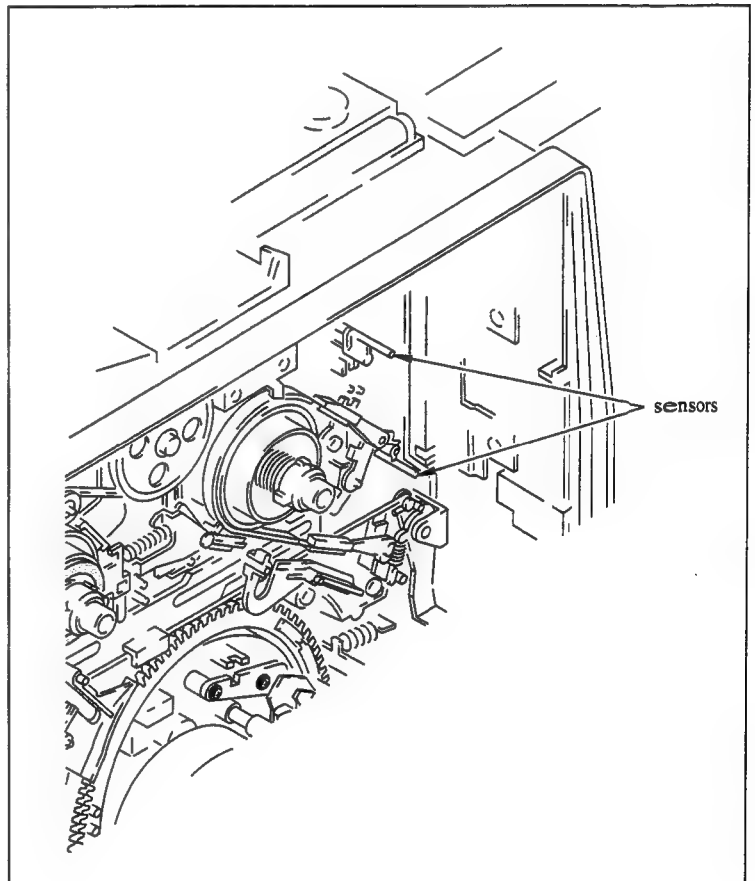
26. Connect the connector CN103 of SS-46P board to the unit.

27. Stand the unit keeping the connector box down.

28. Make sure that the sensor returns smoothly to the original position upon released after pressing down four points of the sensor with finger.

29. Close VA-34P board and install it with two screws. (Refer to Section 1-13.)

30. Close the side panel. (Refer to Section 1-12.)



### Adjustment after replacement

#### 31. Perform the **main brake release adjustment**. (Brake solenoid position adjustment).

- (1) Turn the POWER switch ON.
- (2) Put the unit in STOP mode and push the EJECT button making it in the state of unthreading completed.

**Note:** Never turn the POWER switch OFF, even after unthreading is completed.

- (3) Make sure that the clearance between the T main brake shoe and the take-up reel table is satisfied the required specification using the wire clearance guage. (Specification 1) Make sure that the clearance between the S main brake shoe and the supply reel table is satisfied the required specification. (Specification 2)

If the specifications 1 and 2 are satisfied, perform step 32 and later.

If the specifications 1 and 2 are not satisfied, perform sub-step 4 and later.

- (4) Loosen two screws for 1/2 to one turn which are fixing the solenoid to the brake solenoid mounting bracket.
- (5) Slide the solenoid in the direction of arrow, and fasten the screws in order to satisfy the required specifications required.
- (6) Perform the sub-steps 1 to 3 once again, and make sure that the specifications 1 and 2 are satisfied.

If the specifications 1 and 2 are satisfied, perform step 32 and later.

If the specifications 1 and 2 are not satisfied, perform sub-step 4 and later.

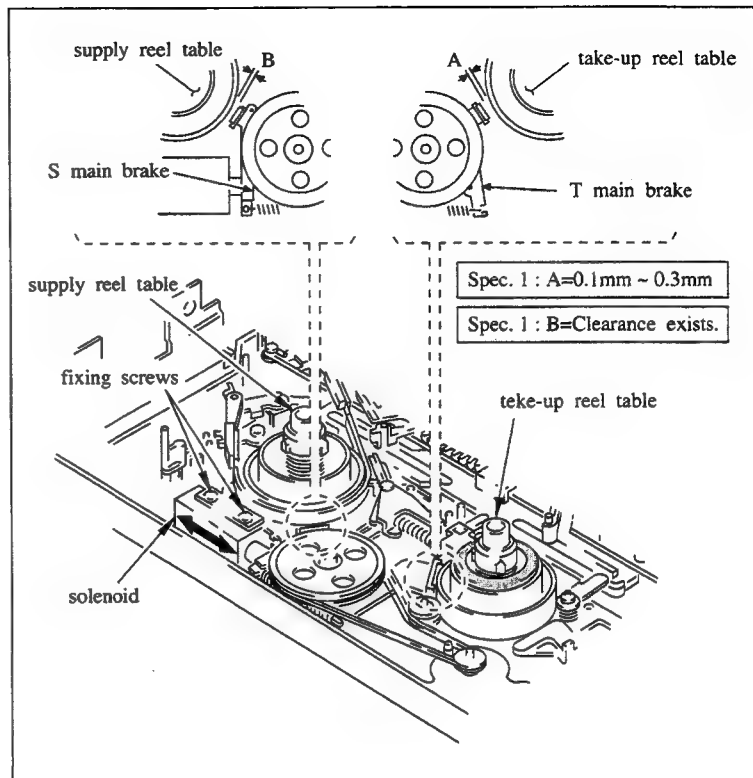
**Note:** If this adjustment is not correctly adjusted, it is possibility to cause tape slack at near battery end state.

32. Put a intermediate pulley in the shaft, and fasten it onto the shaft with a stop ring.

**Note:** If in case the stop ring is deformed, be sure to replace it with a new one.

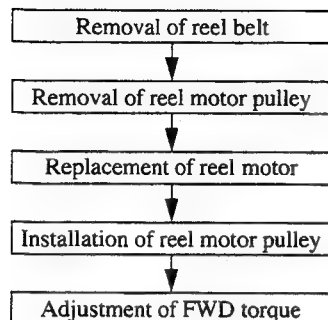
Parts No.: 3-669-465-00

33. Clean the reel belt with a cleaning piece moistened with the cleaning fluid.
34. Install the reel belt. (Refer to Section 3-5.)



### 3-16. REEL MOTOR REPLACEMENT

#### Replacement flow chart



#### Tools

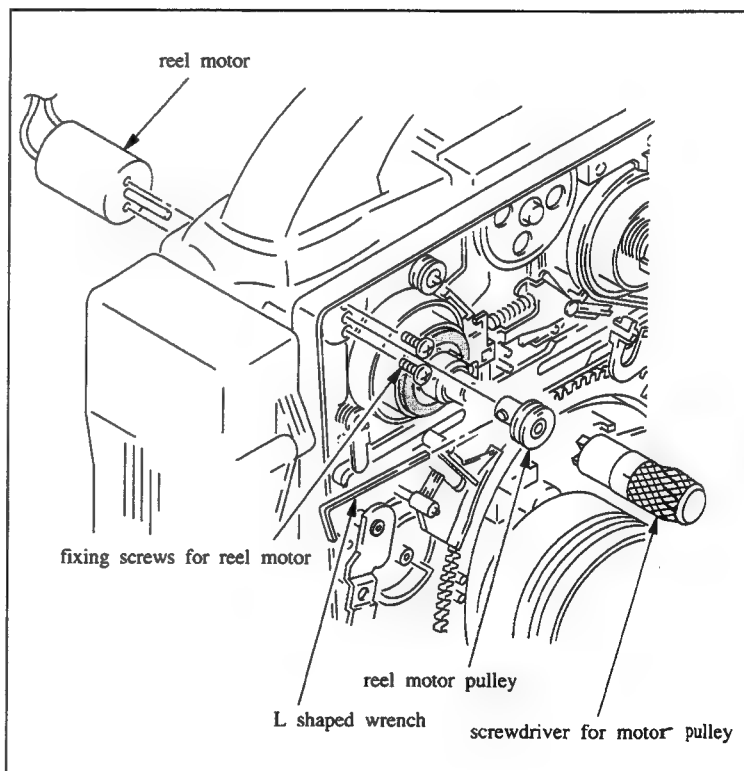
Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
L shaped wrench (across flat has 1.5mm)	: 7-700-736-05
Wire clearance gauge	: J-6152-450-A
Screwdriver for motor pulley	: J-6321-040-A

#### Removal

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Remove a reel belt. (Refer to Section 3-5.)
3. Put the L shaped wrench in the hole at the lower part of a reel motor pulley so as to prevent rotation of the pulley, then remove the reel motor pulley with the screwdriver for motor pulley.
4. Open a side panel. (Refer to Section 1-12.)
5. Open VO-34P board. (Refer to Section 1-13.)
6. Disconnect the connector CN205 on SS-46P board.
7. Close VO-34P board and the side panel tentatively.  
**Note:** Screwing is not required.
8. Remove two screws, and remove the reel motor.

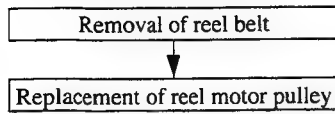
#### Installation

9. Install a new reel motor with two screws.
10. Open VO-34P board and the side panel.
11. Connect the connector of reel motor with the connector CN205 on SS-46P board.
12. Close VO-34P board, and install it with two screws. (Refer to Section 1-13.)
13. Close the side panel. (Refer to Section 1-12.)
14. Put the reel motor pulley in the reel motor shaft.
15. Install the reel motor pulley.  
(Refer to Section 3-16-1.)
16. Install the reel motor pulley and the reel belt after cleaning. (Refer to Section 3-5.)
17. Make sure that the belt is not twisted by rotating the intermediate pulley in the counterclockwise direction manually for two to three turns.
18. Perform the FWD torque adjustment.  
(Refer to Section 3-30.)



### 3-16-1. REEL MOTOR PULLEY REPLACEMENT

#### Replacement flow chart



#### Tools

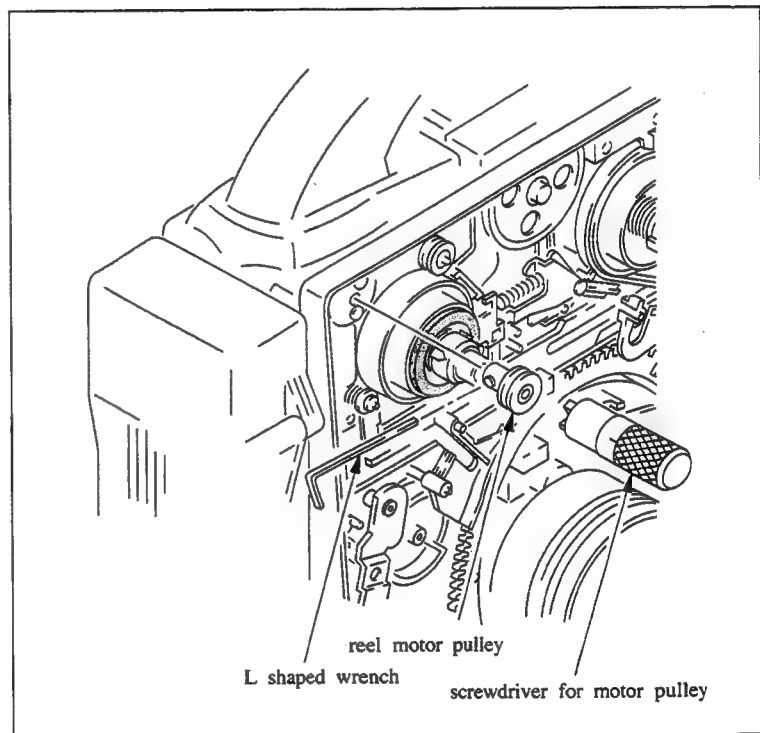
Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01  
L shaped wrench (across flat has 1.5mm) : 7-700-736-05  
Screwdriver for motor pulley : J-6321-040-A

#### Removal

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Remove a reel belt. (Refer to Section 3-5.)
3. Put the L shaped wrench in the hole at the lower part of a reel motor pulley so as to prevent rotation of the pulley, then remove the reel motor pulley with the screwdriver for motor pulley.

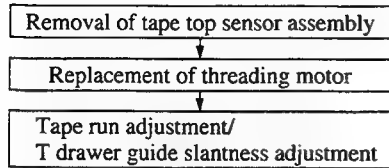
#### Installation

4. Put the L shaped wrench in the hole at the lower part of the reel motor pulley, then install the pulley with screwdriver for motor pulley, while pressing the pulley against chassis.
5. Install the reel belt after cleaning the motor pulley and reel belt. (Refer to Section 3-5.)
6. Make sure that the belt is not twisted by rotating the intermediate pulley in the counterclockwise direction manually for two to three turns.



### 3-17. THREADING MOTOR REPLACEMENT

#### Replacement flow chart



#### Removal

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Open a side panel. (Refer to Section 1-12.)
3. Open VO-34P board. (Refer to Section 1-13.)
4. Disconnect a connector CN101 on SS-46P board, and push it out on the surface of the unit.
5. Close VO-34P board and the side panel tentatively.

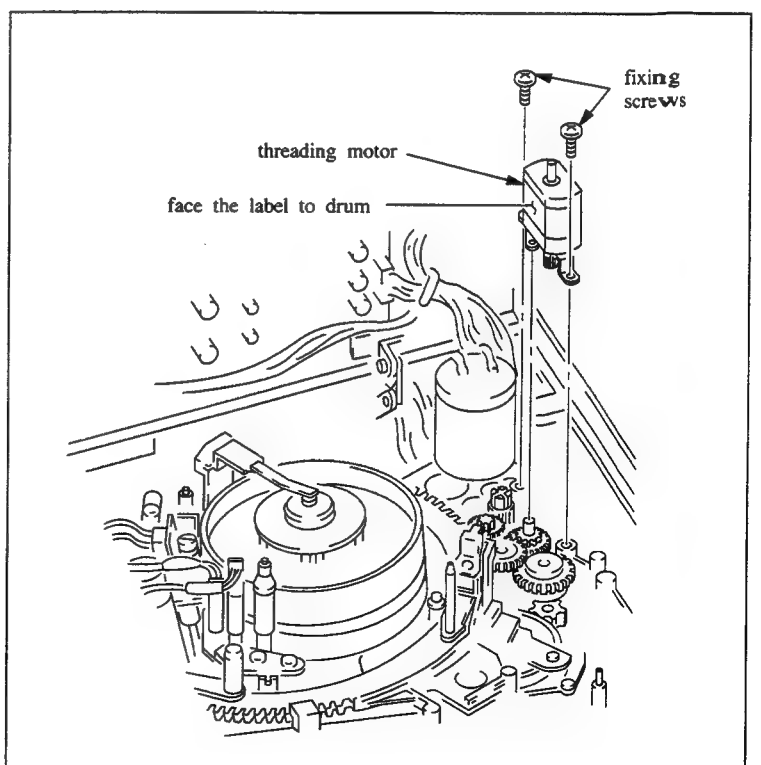
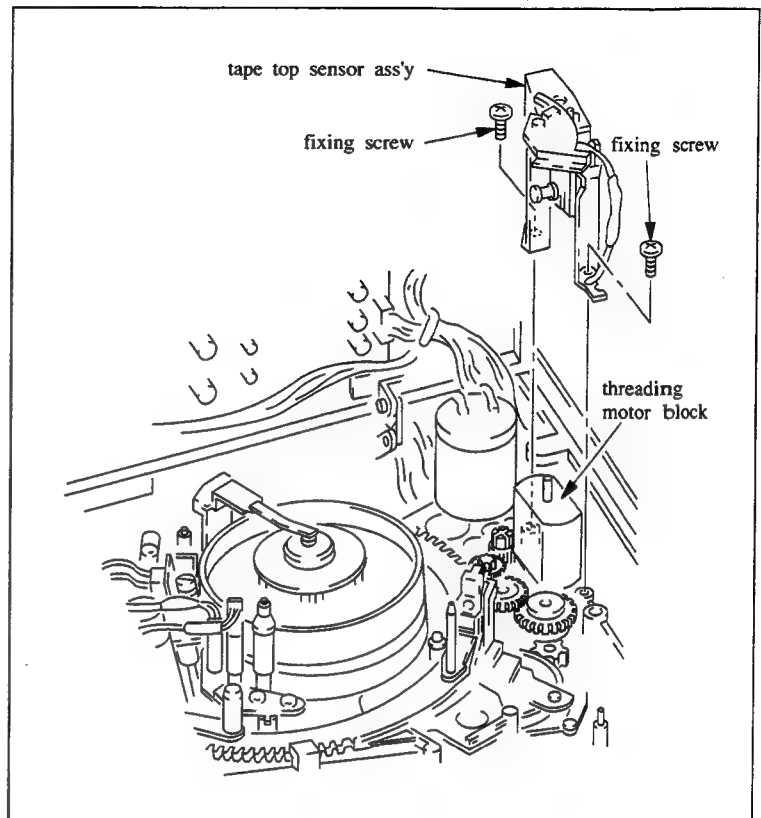
**Note:** Screwing is not required.

6. Remove two screws as shown in the figure, and remove a tape top sensor assembly.

**Note:** Be carefull not to drop the screws inside of the unit during the removal.  
Place the tape sensor assembly close to the take-up reel table.

7. Remove two screws as shown in the figure, and remove a threading motor block.

**Note:** Be carefull not to drop the screws inside of the unit during the removal.

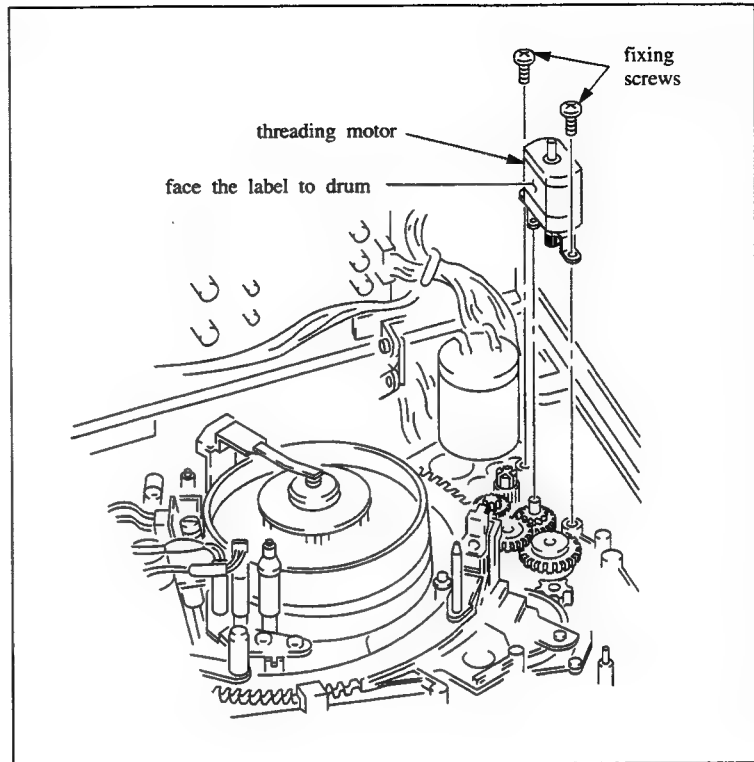


### Installation

8. Remove two screws out of the removed threading motor block, and remove a threading motor.
9. Install a new threading motor to a motor bracket in the direction as shown in the figure.
10. Install a new threading motor block to the chassis with two screws.

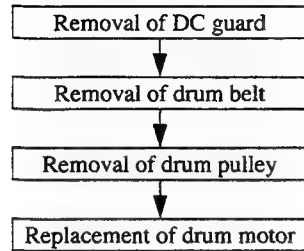
**Note:** Insert the hole of the motor bracket into the shaft of the gear block.

11. Make sure that gears in neighboring area can rotate when motor shaft is turned manually after its installation.
12. Push out the harness of the threading motor block in the back of the unit.
13. Install the removed tape top sensor in step 6 to the chassis with two screws.
14. Open VO-34P board and the side panel.
15. Connect the threading motor connector to CN101 on SS-46P board.
16. Close VO-34P board and install it with two screws. (Refer to Section 1-13.)
17. Close the side panel. (Refer to Section 1-12.)
18. Perform the tape run adjustment/T drawer guide slantness adjustment. (Refer to Section 4-2-5.)



### 3-18. DRUM MOTOR REPLACEMENT

#### Replacement flow chart



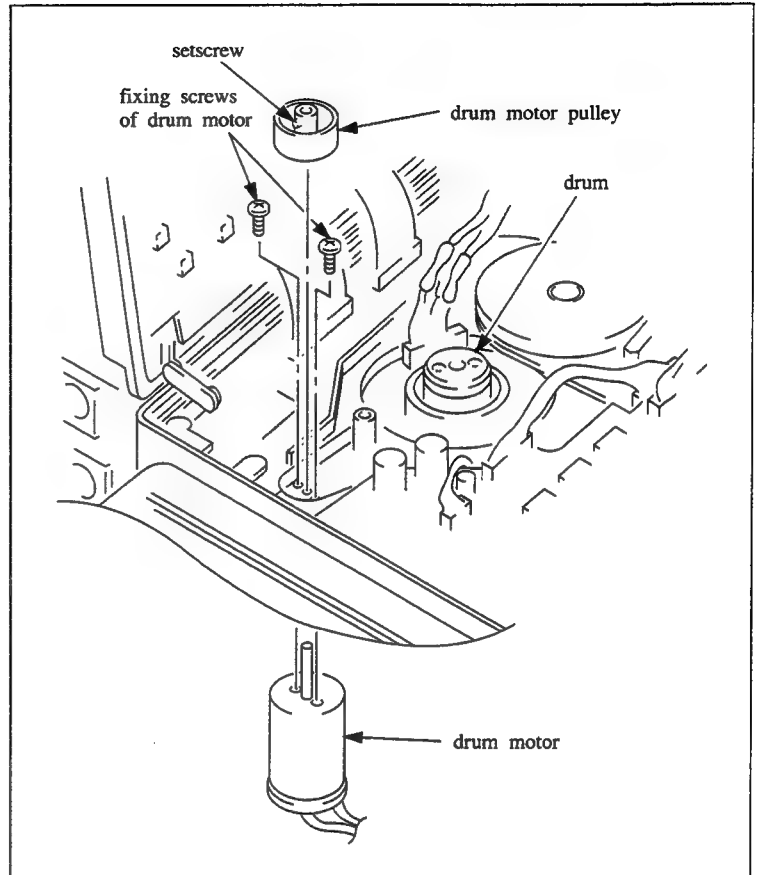
#### Tools

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01  
L shaped wrench (across flat has 0.89 mm) : 7-700-736-06

#### Removal

1. Open a side panel. (Refer to Section 1-12.)
2. Open VO-34P board. (Refer to Section 1-13.)
3. Place the unit keeping a VR lid down.
4. Remove a DC guard. (Refer to Section 3-4.)
5. Remove a drum belt. (Refer to Section 3-4.)
6. Loosen a setscrew of a drum motor pulley with L shaped wrench, and remove it.
7. Disconnect a connector CN202 on SS-46P board.
8. Stand the unit keeping a connector box down.
9. Remove two screws, and remove a drum motor assembly.

**Note:** Be careful not to drop the screws inside of the unit.



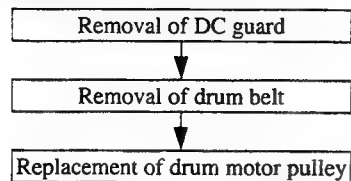
### Installation

10. Install a new drum motor assembly with two screws keeping the black lead wire at drum side.
11. Connect the connector of the drum motor to CN202 on SS-46P board.
12. Insert the drum motor pulley in the drum motor shaft, and tighten a setscrew with L shaped wrench while pressing the motor pulley toward the chassis side.
13. Install the drum belt after cleaning the drum motor pulley and drum belt.  
(Refer to Section 3-6.)  
**Note:** Be sure to install the drum belt with the white marker on the drum belt outside.
14. Rotate the pulley manually in the clockwise direction for two to three turns, and make sure that the drum belt stays in center of the drum pulley and drum motor pulley.
15. Install the DC guard. (Refer to Section 3-4.)
16. Close VO-34P board and install it with two screws. (Refer to Section 1-13.)
17. Close the side panel. (Refer to Section 1-12.)



### 3-18-1. DRUM MOTOR PULLEY REPLACEMENT

#### Replacement flow chart



#### Tools

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01  
L shaped wrench (across flat has 0.89mm) : 7-700-736-06

#### Removal

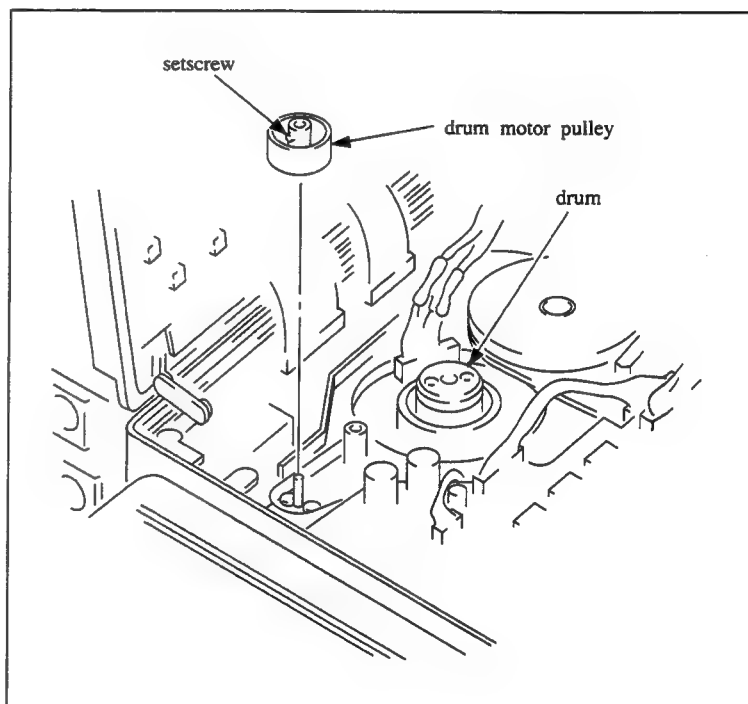
1. Open a side panel. (Refer to Section 1-12.)
2. Open VO-34P board. (Refer to Section 1-13.)
3. Place the unit keeping a VR lid down.
4. Remove a DC guard. (Refer to Section 3-4.)
5. Remove a drum belt. (Refer to Section 3-4.)
6. Loosen a setscrew of a drum pulley using L shaped wrench, and remove it.

#### Installation

7. Remove a setscrew from the removed drum motor pulley, and install it to a new drum pulley.
8. Put a new drum motor pulley in the drum motor shaft and tighten the setscrew with L shaped wrench while pressing the motor pulley toward the chassis.
9. Install the drum belt after cleaning the drum motor pulley and belt. (Refer to Section 3-6.)

**Note:** Be sure to install the drum belt with white marker on the drum belt outside.

10. Rotate the drum pulley manually in the clockwise direction for two to three turns, and make sure that the drum belt stays in center of the drum pulley and drum motor pulley.
11. Install the DC guard. (Refer to Section 3-4.)
12. Close VO-34P board, and install it with two screws. (Refer to Section 1-13.)
13. Close the side panel. (Refer to Section 1-12.)



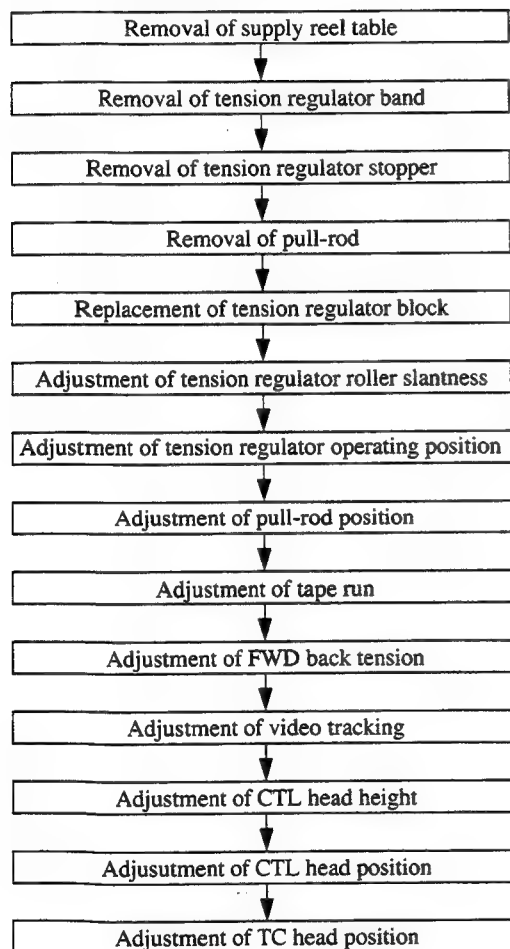
### 3-19. TENSION REGULATOR BLOCK REPLACEMENT

Perform the slantness adjustment of a tension regulator roller after the replacement of a tension regulator block. This adjustment is performed with the use of relevant tools.

But the slantness adjustment of the tension regulator roller is the pre-adjustment for tape run adjustment at later stage.

The most appropriate slantness of the tension regulator to meet the unit under adjustment can be obtained by performing the tape run adjustment.

#### Replacement flow chart



#### Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Cassette reference plate	: J-6080-008-A
Tension regulator slantness check tool	: J-6190-800-A

### Removal

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)

2. Remove a supply reel table.

(Refer to Section 3-13.)

**Note:** Be careful not to lose steel washer and polyslider washer at the lower part of the reel table when the reel table is removed. They may detach together with the reel table.

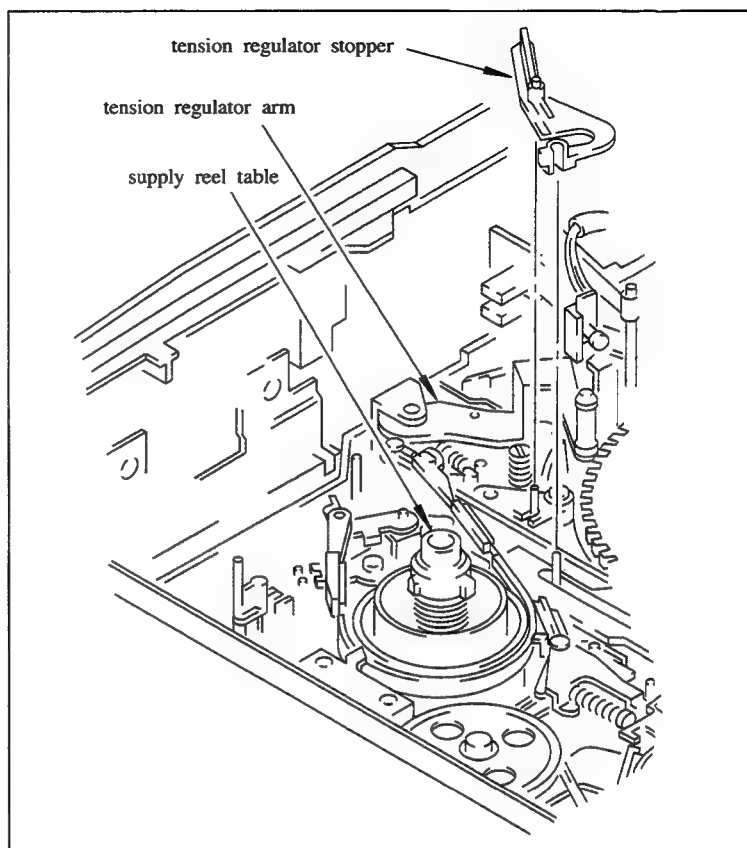
(Refer to Section 3-13.)

3. Remove a tension regulator band.

(Refer to Section 3-13.)

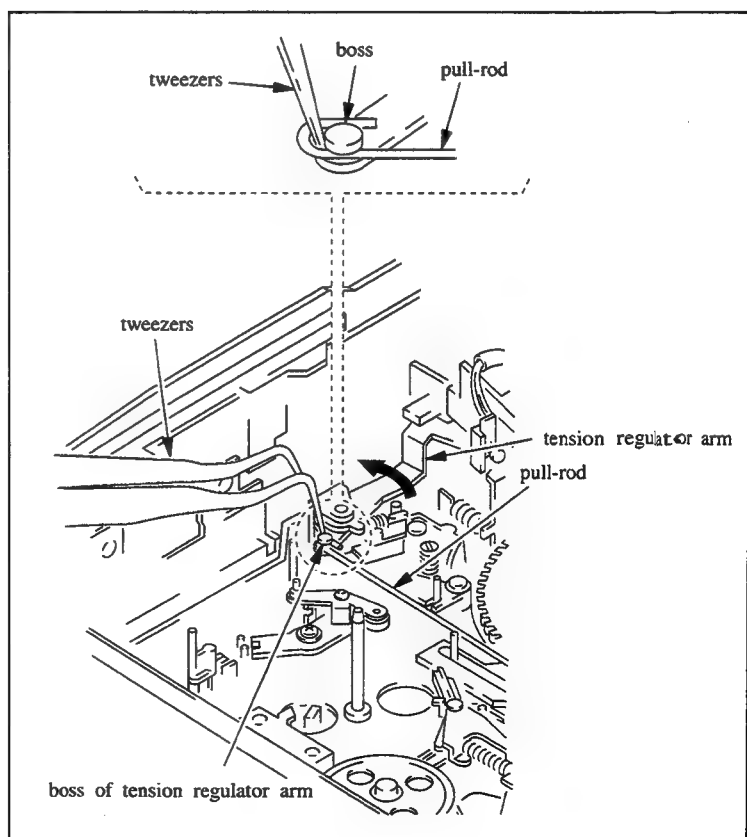
**Note:** Never twist or bend the tension regulator band under any circumstances when removing it.

4. Pull a tension regulator stopper upward, and remove it from two shafts.



5. After pushing a tension regulator arm slightly in the direction of the arrow, place a pair of fine tip tweezers between a pull-rod and boss of the tension regulator arm.

6. Remove the pull-rod from the boss while pushing the tension regulator arm with finger in the direction of arrow.



7. Remove ■ screw and the stepped screw as shown in the figure.

**Note:** Be carefull not to lose a spring. It may detach together with the stepped screw when it is removed.

8. Remove a tension regulator block from the unit.

#### Installation

9. Remove a setscrew from the removed tension regulator, and install it to a new tension regulator block.
10. Install a new tension regulator block with a fixing screw and stepped screw accompanied by a compression spring.

**Note:** Tighten the stepped screw firmly. Tighten the other screw snugly, but do not tighten firmly. It places by loosening it for one to two turns from the firmly tightened condition. (Adjustment will be performed using this screw at later stage.)

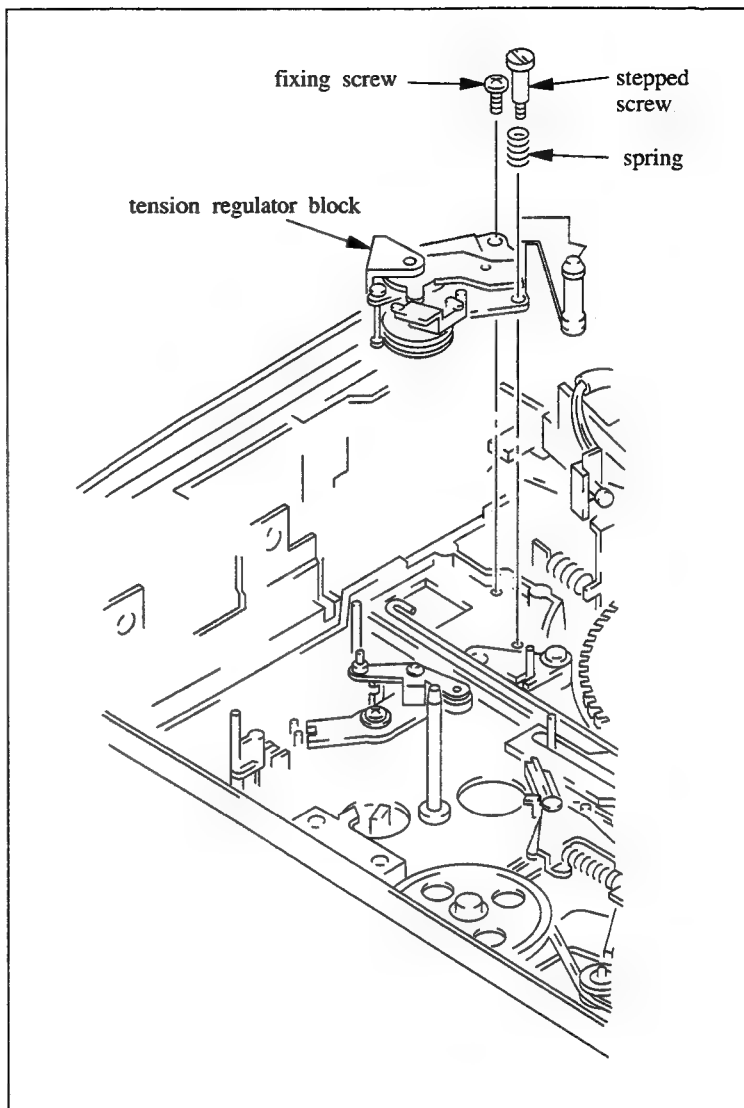
11. After pushing the tension regulator arm with finger in the same direction of step 6, install the pull-rod to the boss.
12. Install the tension regulator stopper into two shafts.
13. Install the tension regulator band.  
(Refer to Section 3-8.)

**Note:** Never twist or bend the tension regulator band under any circumstances when it is installed.

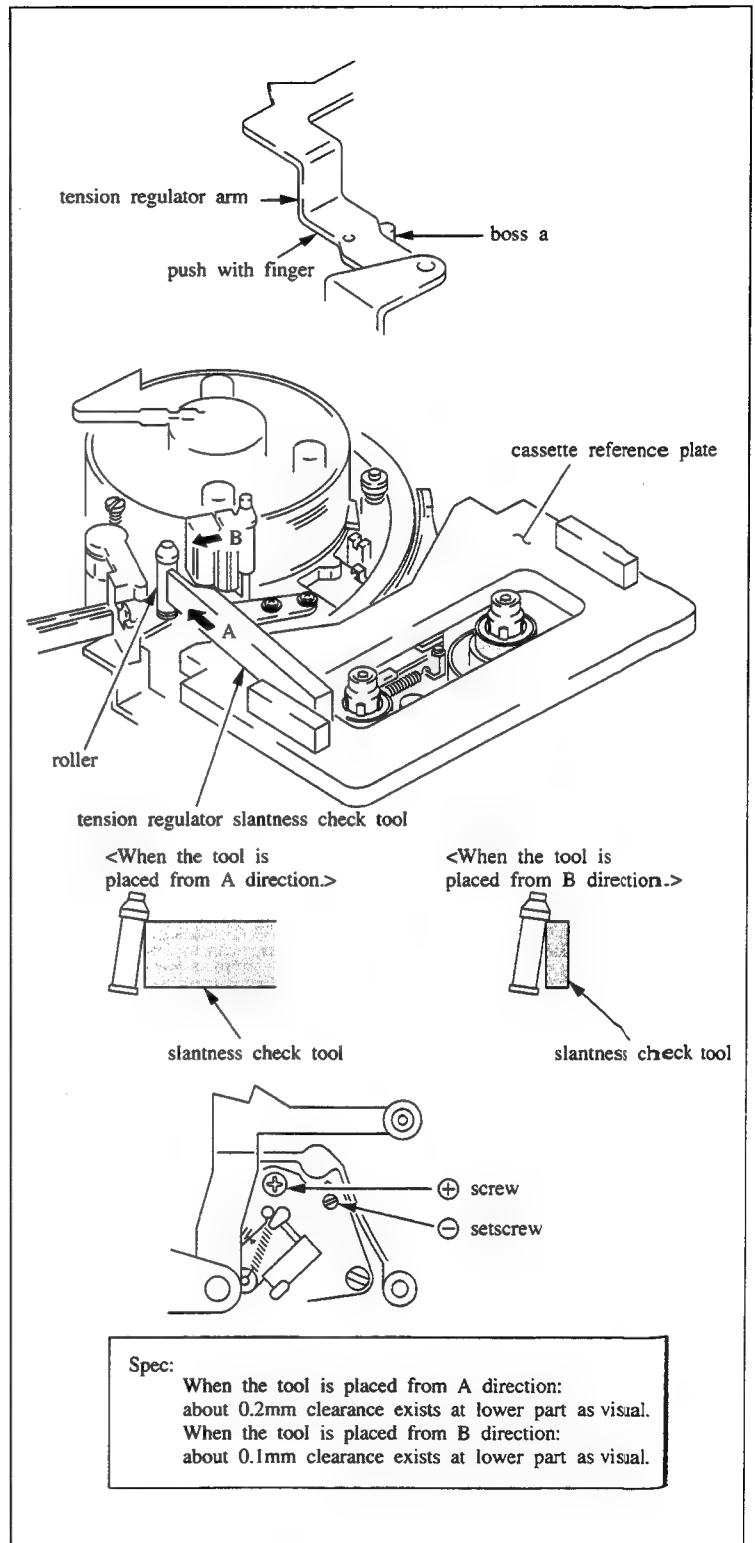
14. Install the supply reel table.  
(Refer to Section 3-13.)

#### Adjustment after replacement

15. Perform the **tension regulator roller slantness adjustment**.
  - (1) Put the unit into threading end mode.  
(Refer to Section 3-1.)
  - (2) Clean both surfaces of cassette reference plate with a cleaning piece moistened with cleaning fluid.
  - (3) Clean the surface of tension regulator slantness check tool in the same manner.

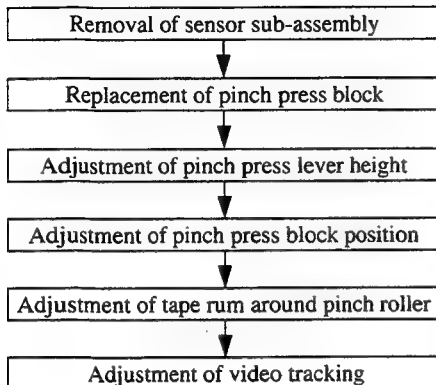


- (4) Place the the cassette reference plate on four cassette pillars.
- (5) By pushing the tension regulator arm softly with finger in the direction of the drum, let it touch on the boss "a" of the tension regulator.
- (6) While maintaining step (5), let the tension regulator slantness check tool touch on the roller of the tension regulator from A and B directions.  
If both specifications are satisfied when the tool is placed from A and B directions, perform step 16 and later.  
If the specification is not satisfied when the tool is placed from A direction, perform sub-step (7) and later.  
If the specification is not satisfied when the tool is placed from B direction, perform sub-step (8) and later.
- (7) Adjustment method in case that the specification is not satisfied when the tool is placed from A direction.
  - 1) Adjust it to satisfy the required specification by turning setscrew.  
The clearance at lower part gets wider when setscrew is turned in the clock-wise direction.
  - 2) Be sure to check once again by performing sub-step (8) after adjustment completes.
- (8) Adjustment method in case that the specification is not satisfied when the tool is placed from B direction.
  - 1) Adjust it to satisfy the required specification by turning + screw.  
The clearance at the lower part gets narrower when + screw is turned in the clockwise direction.
  - 2) Be sure to check once again by performing sub-step (7) after the adjustment completes.
- (9) Perform both sub-steps (5) and (6) once again and make sure that both specifications are satisfied.
16. Perform tension regulator operating position adjustment. (Refer to Section 3-8.)
17. Perform pull-rod position adjustment. (Refer to Section 3-8.)
18. Perform overall adjustment relating to tape run adjustment. (Refer to Section 4-2.)
19. Perform FWD back tension adjustment. (Refer to Section 3-8.)
20. Perform video tracking adjustment. (Refer to Section 4-3.)
21. Perform CTL head height adjustment. (Refer to Section 4-7.)
22. Perform CTL head position adjustment. (Refer to Section 4-8.)
23. Perform TC head position adjustment. (Refer to Section 4-12.)



### 3-20. PINCH PRESS BLOCK REPLACEMENT

#### Replacement flow chart



#### Tool

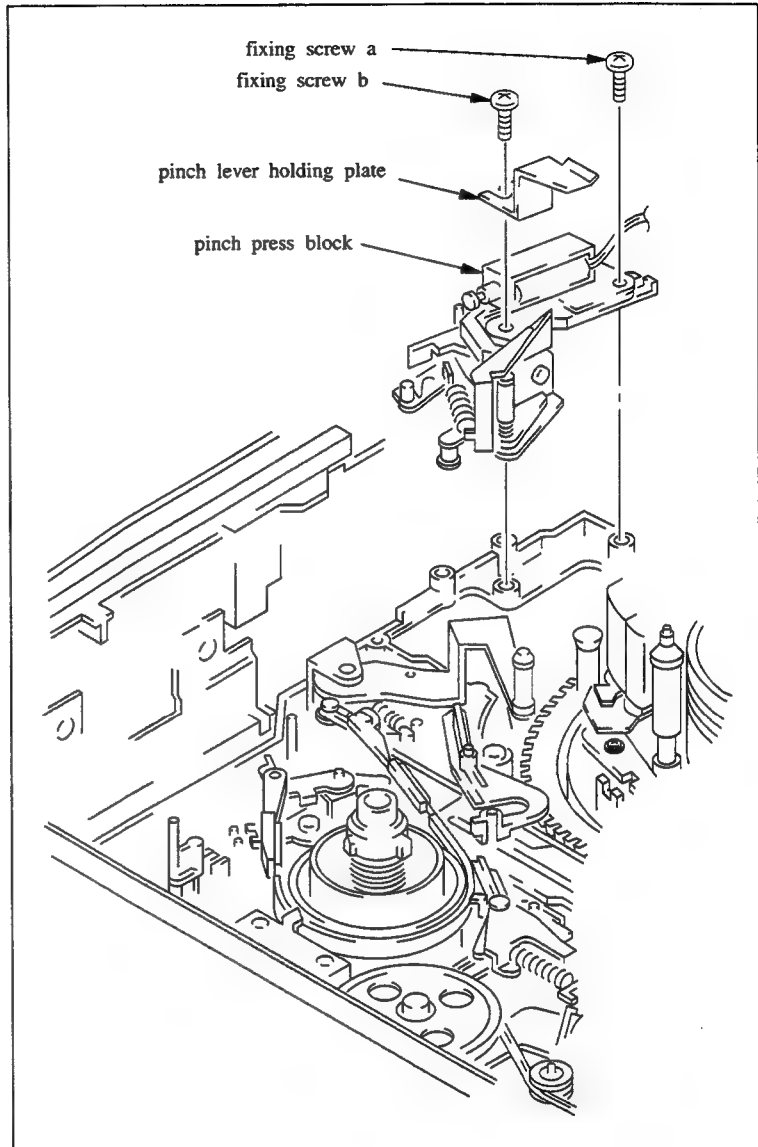
Wire clearance gauge : J-6152-450-A

#### Removal

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Remove the harness of a CTL head and full erase head from the harness holder of sensor sub-assembly. (Refer to Section 3-7.)
3. Remove a fixing screw of the sensor sub-assembly, and lift the sensor sub-assembly together with the harness attached to it.
4. Open a side panel. (Refer to Section 1-12.)
5. Open VO-34P board. (Refer to Section 1-13.)
6. Disconnect a connector CN102 on SS-46P board, and push it out on the surface of the unit.
7. Close VO-34P board and the side panel tentatively.

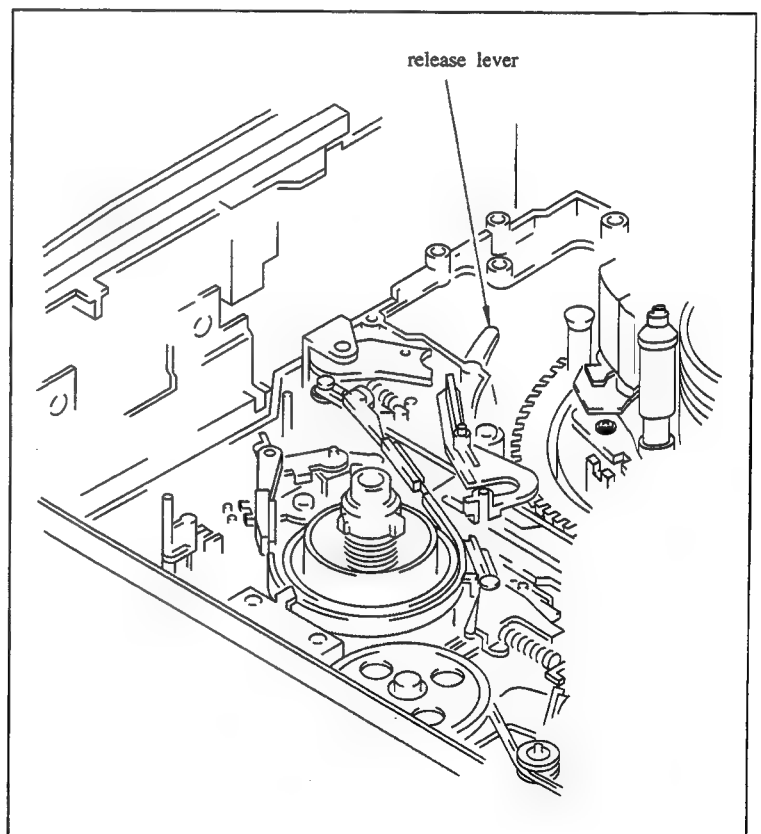
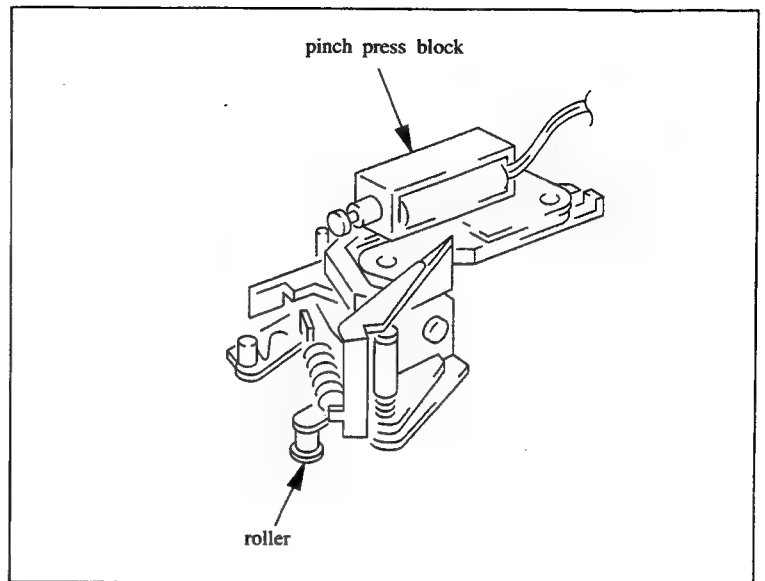
**Note:** Screwing is not required.

8. Remove two screws (a and b) which are mounting a pinch press block as shown in the figure, and remove the pinch press block. Fixing screw b is fixing a pinch lever holding plate together with the pinch press block.



### Installation

9. Install a new pinch press block to the unit so as to put the roller of the lower part of pinch press block is on the left side (cabinet side) of a release lever.
10. Fasten the pinch press block tentatively with screw a.
11. Install the pinch press block with screw b together with the pinch lever holding plate.
12. Tighten screw a.
13. Install the sensor sub-assembly.
14. Open VO-34P board and the side panel.
15. Connect the connector of pinch solenoid with the connector CN102 on SS-46P board.
16. Close VO-34P board, and install it with two screws. (Refer to Section 1-13.)
17. Close the side panel. (Refer to Section 1-12.)



#### Adjustment after replacement

18. Perform the pinch press lever height adjustment.

19. Perform the **pinch press block position adjustment**.

(1) Put the switch S5 on SS-46P board in "SLACK MUTE ON" state.

(2) Put the unit into PLAY mode.

(3) Make sure that the clearance between pinch press levers A and B satisfies the required specifications using the wire clearance gauge. (Specification: 1)

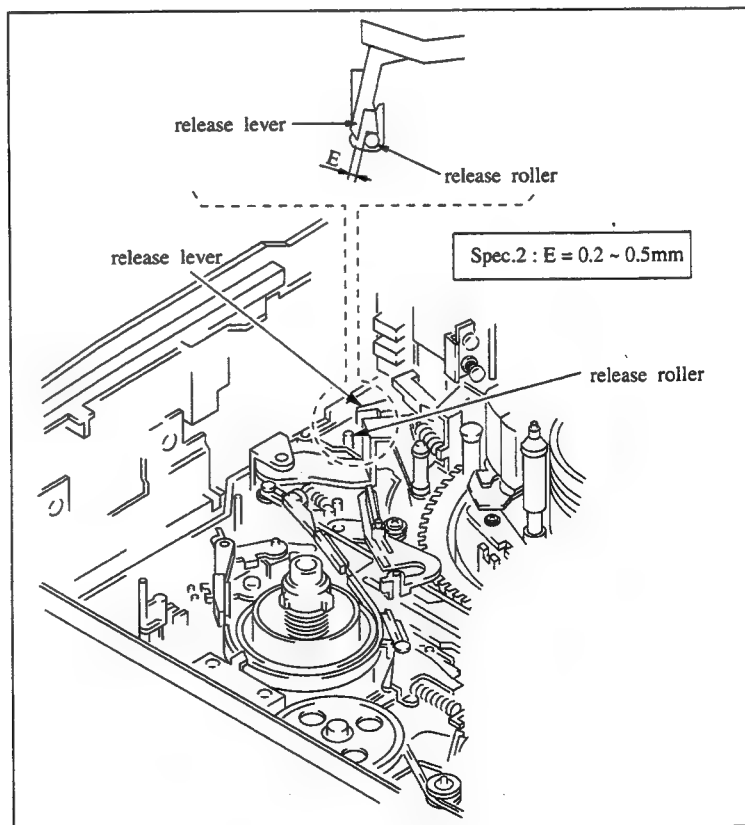
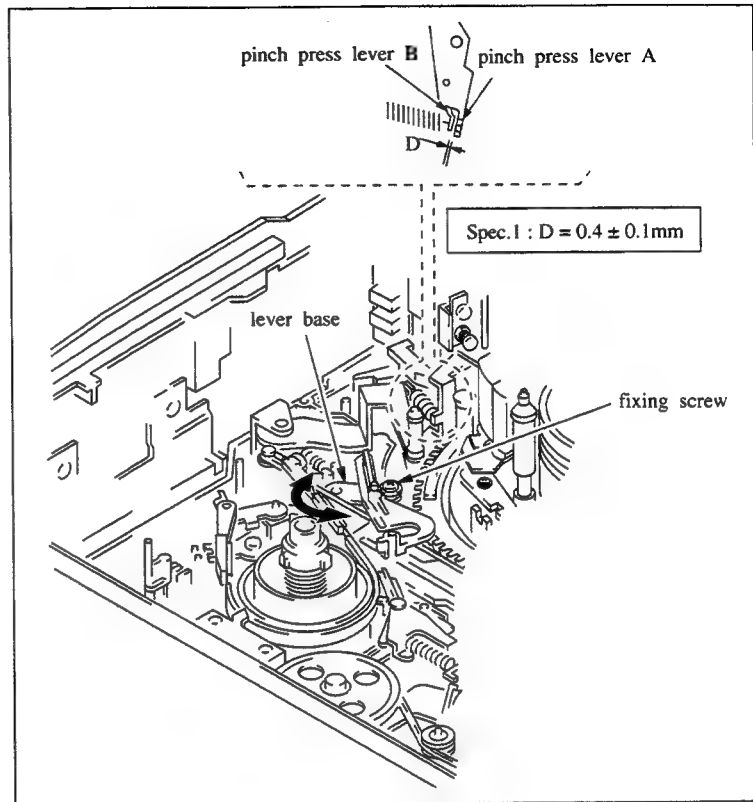
Make sure that the clearance between a release lever and release roller satisfies the required specification while pushing the tension regulator arm gently with finger in the direction of the supply reel table. (Specification: 2)

If the specifications 1 and 2 are satisfied, perform step 20 and later.

If the specifications 1 and 2 are not satisfied, perform sub-step (4) and later.

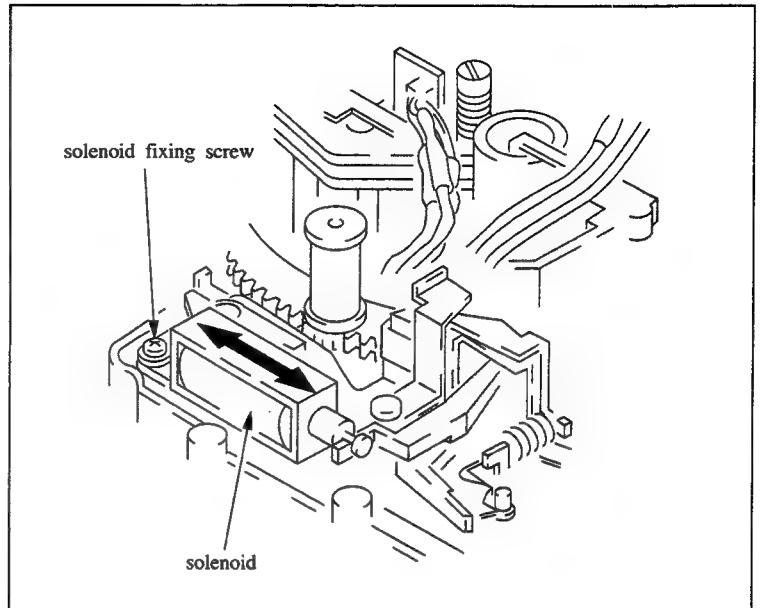
(4) Loosen a screw for fixing a lever base for 1/3 to 1/2 turn.

(5) Adjust the lever base by moving it in the direction of arrow in order to satisfy the specification 1, and tighten a fixing screw.





- (6) Loosen two solenoid fixing screws for 1/3 to 1/2 turn.
- (7) Adjust the solenoid by moving it in the direction of arrow in order to satisfy the specification 2, and tighten the fixing screws.
- (8) Repeat sub-step (3) to make sure both specifications 1 and 2 are satisfied.  
If the specifications are not satisfied, repeat sub-step (3) through (7).
- (9) Put the unit into STOP mode.  
(Refer to Section 3-1.)

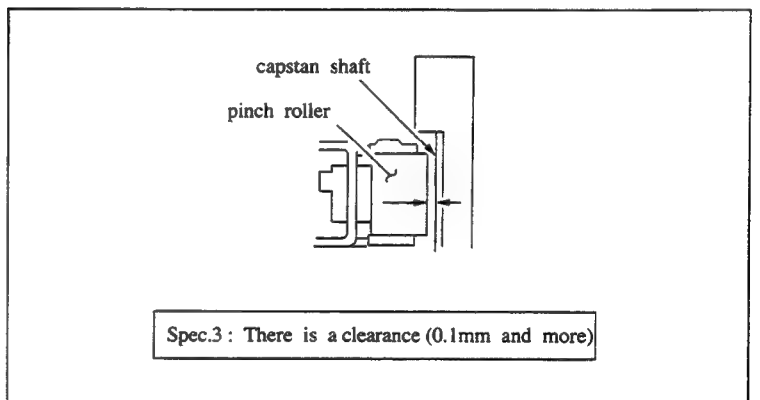


- (10) Make sure visually that there is a clearance between a pinch roller and capstan shaft. (Specification 3)

If the specification 3 is not satisfied, perform sub-step (1) through (8) once again, and adjust it to satisfy all of the specifications 1 through 3.

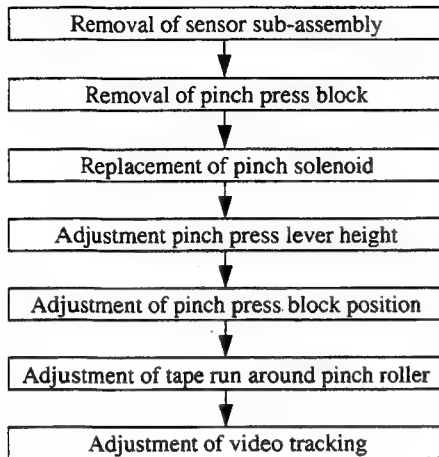
**Note:** After the adjustment, be sure to put switch S5 on SS-46P board in "SLACK MUTE OFF" state.

20. Perform tape run adjustment around pinch roller. (Refer to Section 4-2-4.)
21. Perform video tracking adjustment. (Refer to Section 4-3.)



### 3-20-1. PINCH SOLENOID REPLACEMENT

#### Replacement flow chart



#### Removal

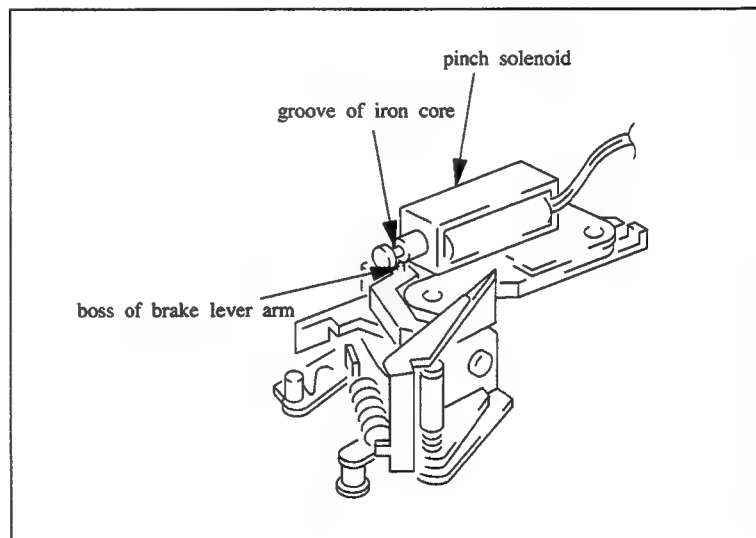
1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Remove a sensor sub-assembly. (Refer to Section 3-20.)
3. Remove a pinch press block. (Refer to Section 3-20.)
4. Remove a pinch solenoid by removing two screws.

#### Installation

5. Install a new pinch solenoid. At that time, the boss of a brake lever arm shall be put inside of the groove of iron core of the pinch solenoid.
6. Install the pinch press block to the unit. (Refer to Section 3-20.)

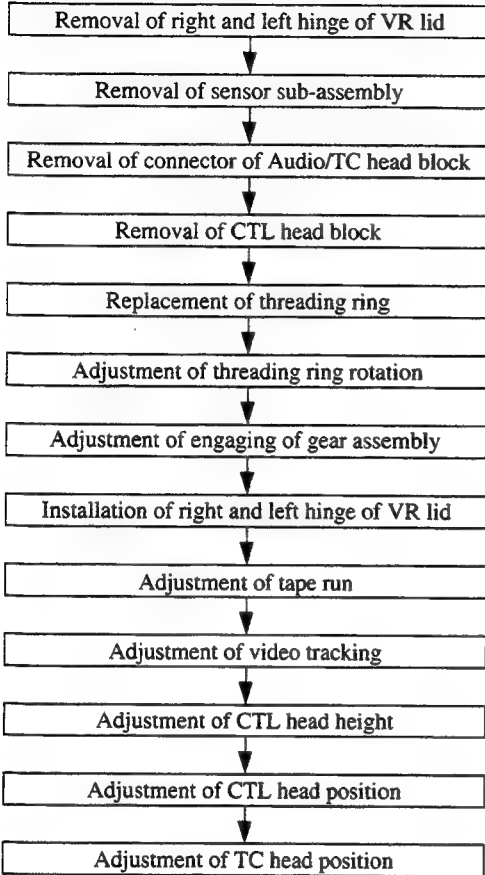
#### Adjustment after replacement

7. Perform pinch press lever height adjustment. (Refer to Section 3-7.)
8. Perform pinch press block position adjustment. (Refer to Section 3-20.)
9. Perform tape run adjustment around pinch roller. (Refer to Section 4-2-4.)
10. Perform video tracking adjustment. (Refer to Section 4-3.)



### 3-21. THREADING RING REPLACEMENT

#### Replacement flow chart

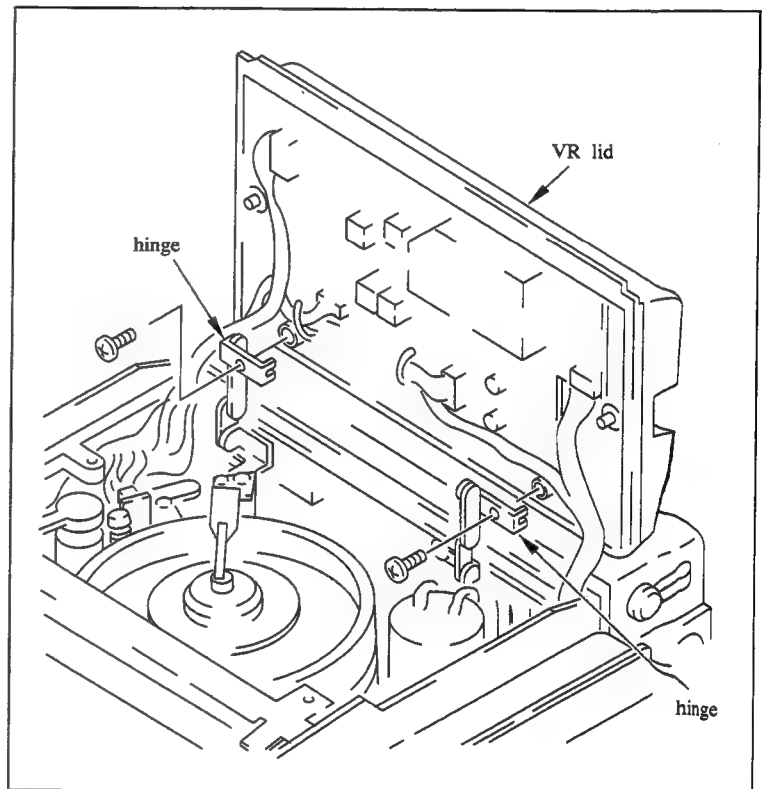


#### Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Wire clearance gauge	: J-6152-450-A
Grease (SGL-505)	: 7-662-010-04

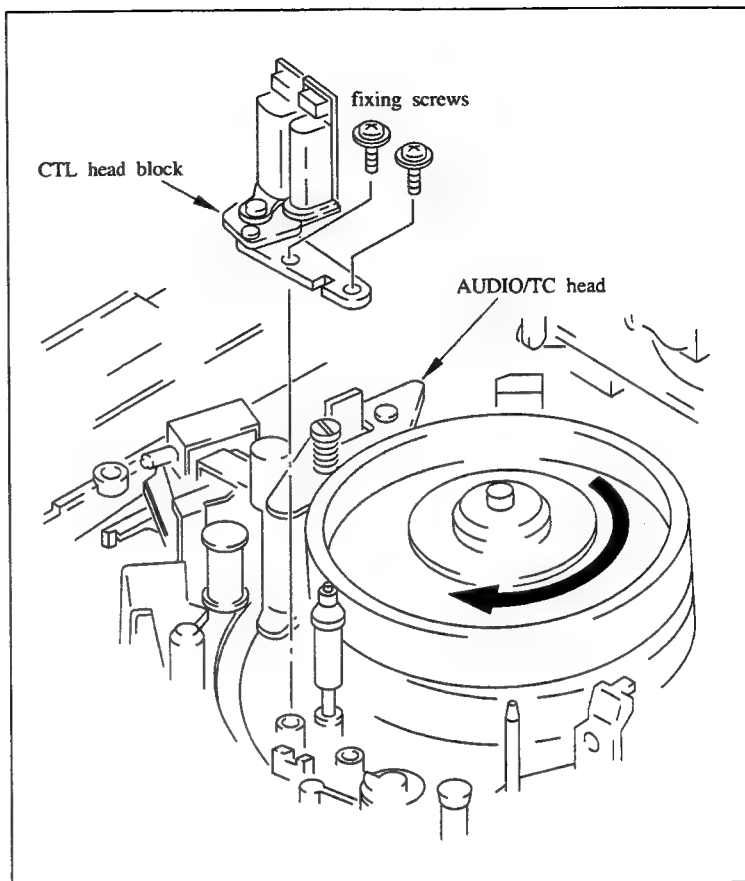
#### Removal

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Remove two fixing screws of right and left hinge of a VR lid, and remove the VR lid. At that time, leave the harness in connected condition as it is.

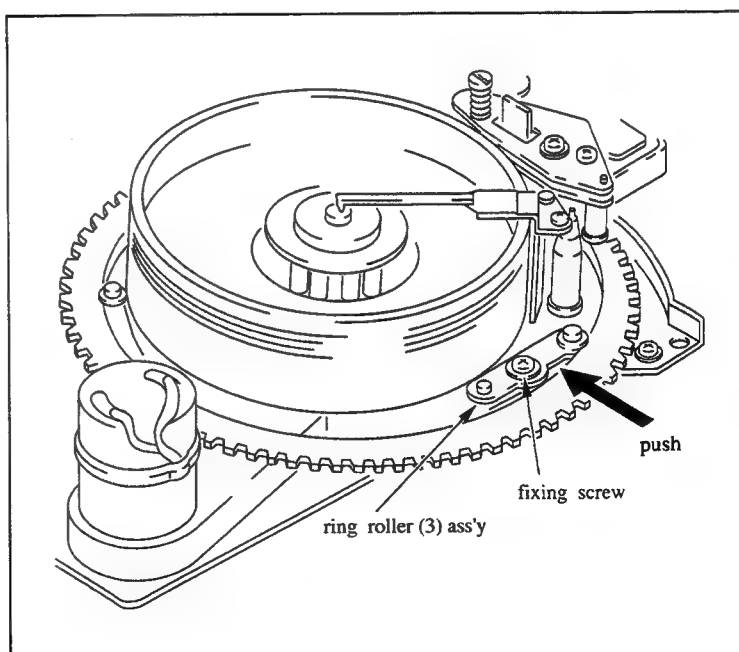


3. Remove a tape retainer. (Refer to Section 3-2.)
4. Remove a sensor sub-assembly, and place it outside of the unit. (Refer to Section 3-7.)
5. Disconnect the harness connector of CN006 on MB-363 board and CN006 on AU-144P which connects with an Audio/TC head.
6. Rotate an upper drum with finger, and put the video head in the position not too close to the Audio/TC head.
7. Remove two screws which are fixing a CTL head block, and remove the CTL head block.

**Note:** Be careful not to cause damage to the drum during CTL head block removal.



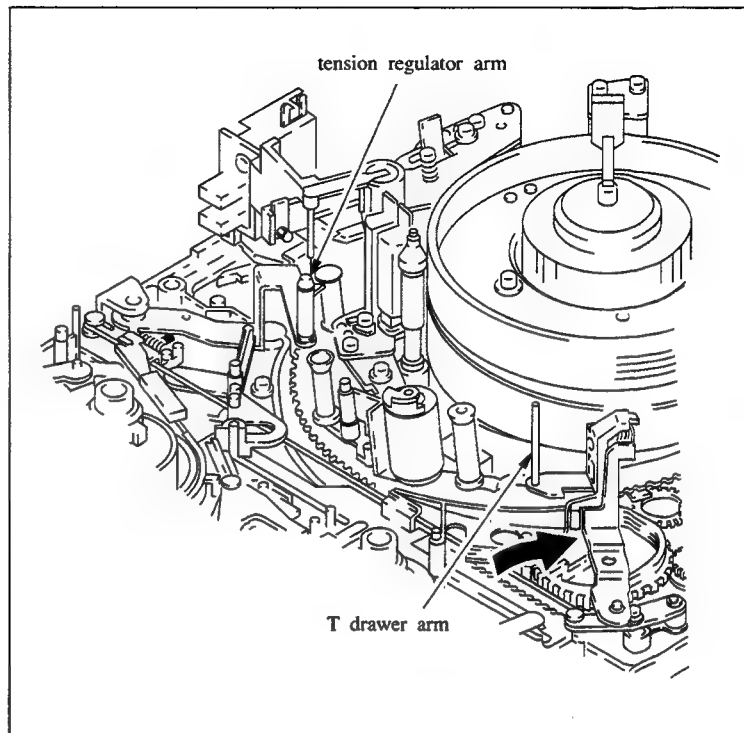
8. Remove a stop ring of a ring drive gear on a gear block ass'y, and remove the ring drive gear.
9. Loosen a fixing screw of a ring roller (3) assembly as shown in the figure, and push the ring roller in the direction of the drum.



10. As a first step, remove a threading ring by lifting the part behind the drum of the threading ring.

As the next step, push a T drawer arm in the direction of the arrow, then remove the threading ring from the unit while moving the T drawer arm and tension regulator arm into the position upon threading completion.

**Note:** At the time of removal, be careful not to cause damage to the drum, capstan shaft and tape guide etc.

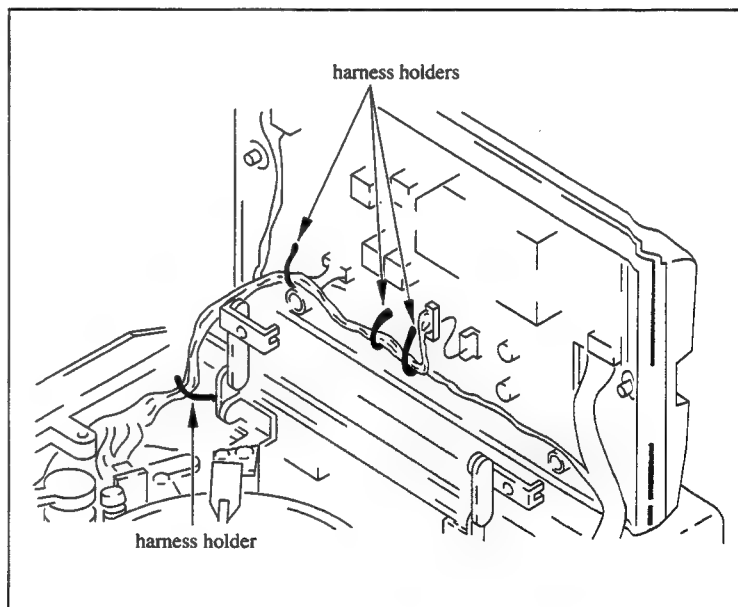


#### Installation

11. Install a new threading ring, in the reverse order of step 10, while placing pinch a roller at the side of reel table (Unthreading end position).

**Note:** At the time of installation, be careful not to cause damage to drum, capstan shaft and tape guide etc.

12. By putting the threading ring in the groove of the ring roller at 3 points, fix the ring roller (3) while pushing it in the direction of cabinet side.
13. Install the CTL head block with two screws while pressing gently in the direction of the drum.
14. Connect the harness connector of AUDIO/TC head with CN006 on MB-363 board and CN006 on AU-144P board, and hold the harness with the harness holders.
15. Install the sensor sub-assembly.



### Adjustment after replacement

#### 16. Perform the **threading ring rotation adjustment**.

- (1) Loosen a fixing screw of the ring roller (3) tentatively.
- (2) Insert a wire clearance gauge of 0.1 mm dia. between the ring roller (3) and threading ring, and shift the ring roller (3) as close as possible to the cabinet side.
- (3) Tighten a screw of the ring roller (3).
- (4) Withdraw the wire clearance gauge.
- (5) Rotate the threading ring manually make sure that the threading ring rotates smoothly.

#### 17. Smear grease to the inside edge of the threading ring. Standard amount of grease smearing is indicated in the figure.

- (1) Smear grease to the inside edge of the ring as much as to create a thin film of grease.
- (2) Grease must not heap up at any part.
- (3) Grease must not overflow onto the ring surface, and wipe it off, if it actually happens.

**Note:** Be careful not to cause attachment of grease to the tape guide, pinch roller and etc..

If it attaches, wipe it off with a cleaning piece moistened with cleaning fluid.

#### 18. Clean the pinch roller, tape guide, drum, stationary head, and capstan and etc. with a cleaning piece moistened cleaning fluid.

#### 19. Install the right and left hinge of the VR lid.

#### 20. Install the tape retainer.

#### 21. Install the ring drive gear and perform the gear assembly engagement adjustment.

(Refer to Section 3-22.)

#### 22. Perform tape run adjustment.

(Refer to Section 4-2-1 through 4-2-6.)

#### 23. Perform video tracking adjustment.

(Refer to Section 4-3.)

#### 24. Perform CTL head height adjustment.

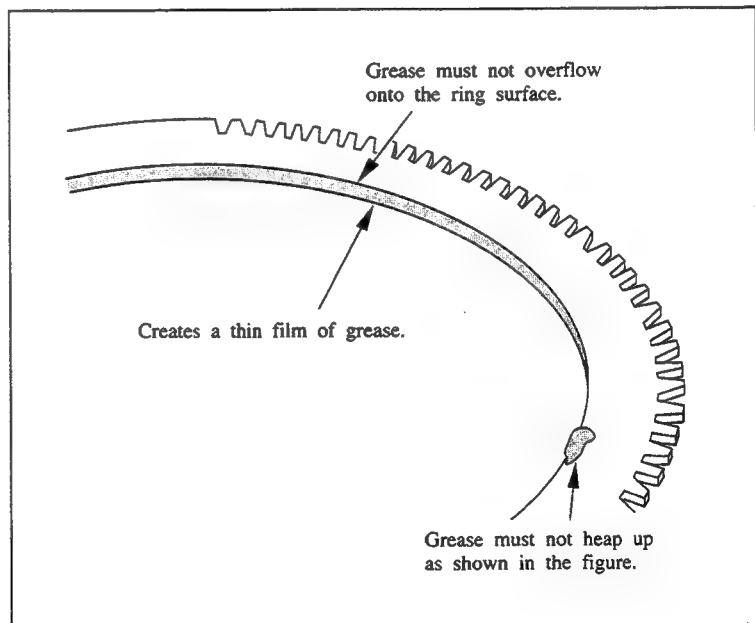
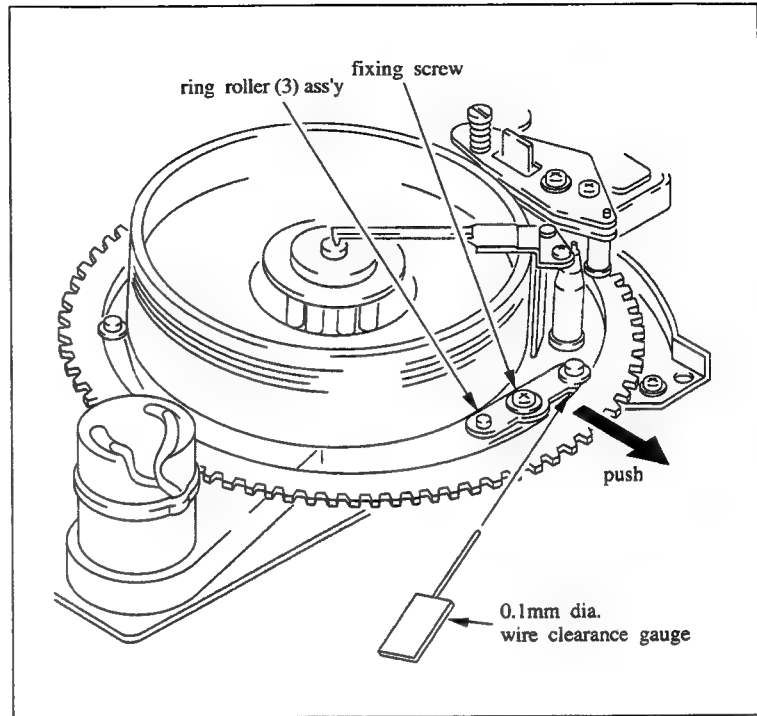
(Refer to Section 4-7.)

#### 25. Perform CTL head position adjustment.

(Refer to Section 4-8.)

#### 26. Perform TC head position adjustment.

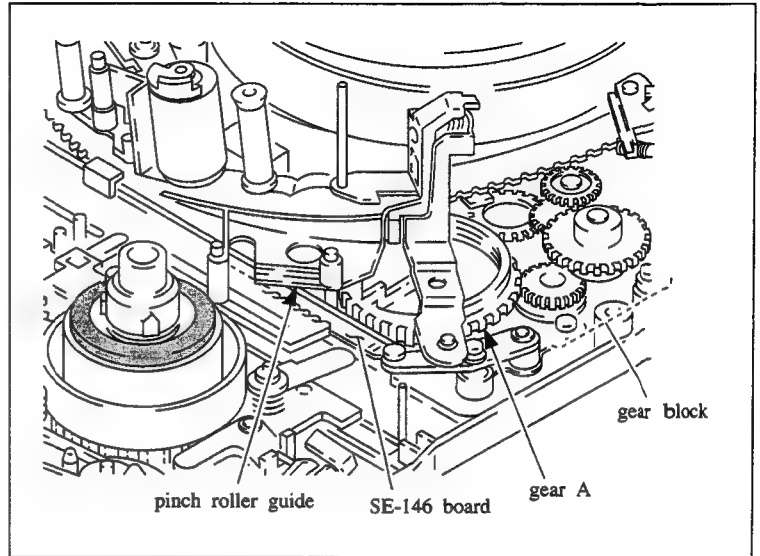
(Refer to Section 4-12.)



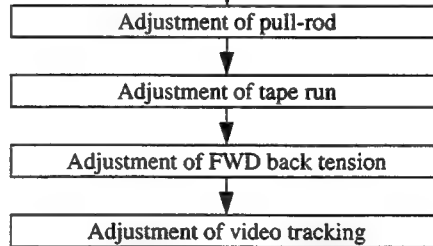
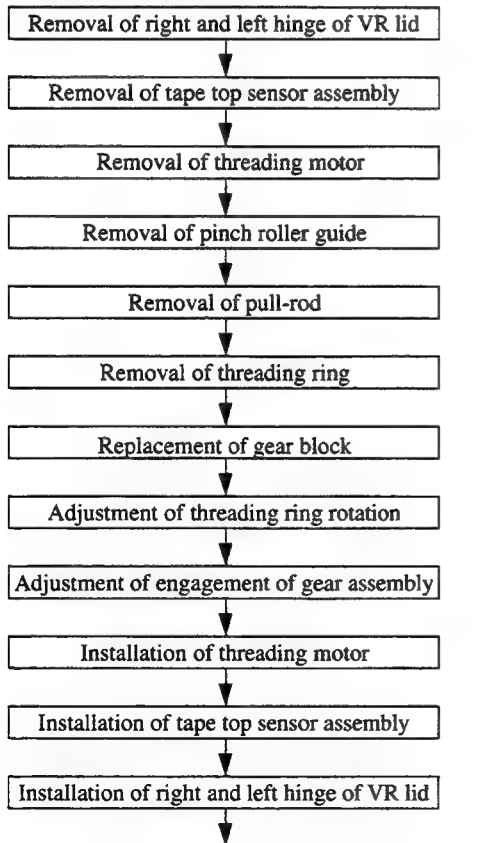
### 3-22. GEAR BLOCK REPLACEMENT

**Note 1:** Cannot replace SE-164 board on a gear block as an individual part. Be sure to replace the whole gear block as a unit.

**Note 2:** It is not recommended to replace a gear A of the gear block part and the gears in its peripheral area as individual parts. It is recommended to replace the gear block as a whole assembly. For its replacement, a great deal of time and high level of technique are required. (At the time of replacement, it is necessary to remove majority of parts inside of the gear block. Also for assembly, high level of technique concerning the gear combination and its performance are indispensable.)



#### Replacement flow chart

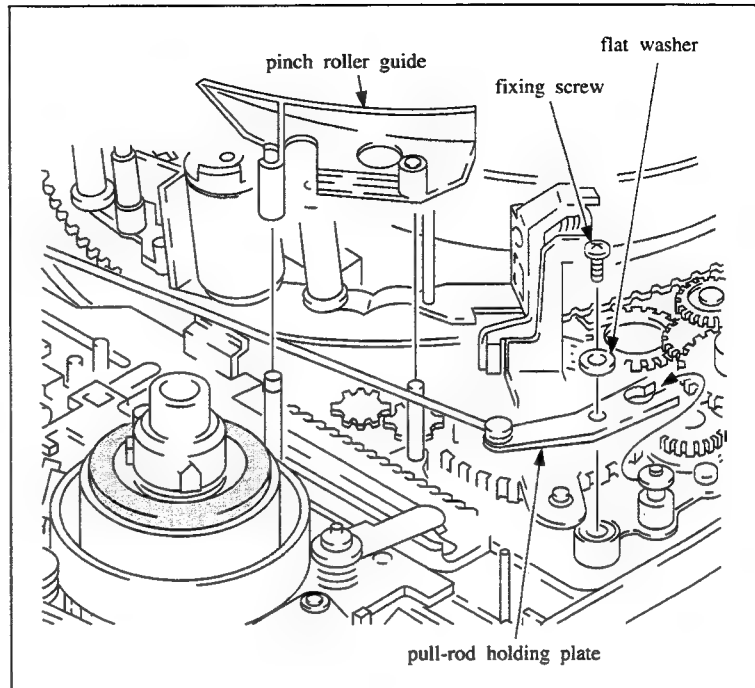


#### Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Wire clearance gauge	: J-6152-450-A
Grease (SGL-505)	: 7-662-010-04

## Removal

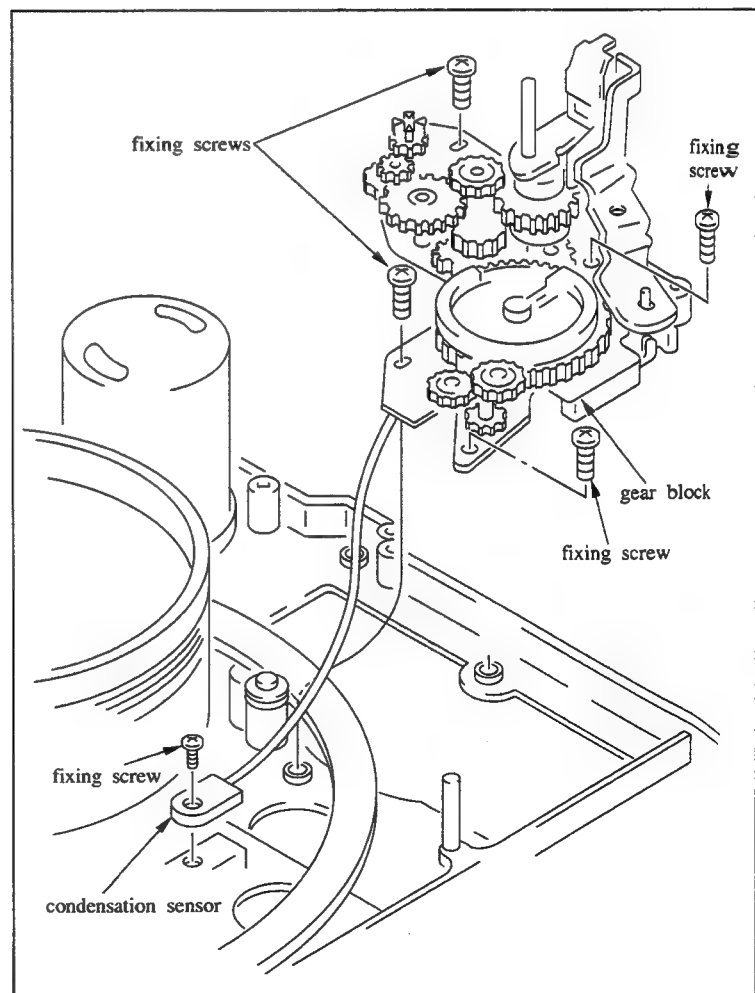
1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Remove two fixing screws of right and left hinge of VR lid, and remove the VR lid. At that time, harness may be left as it is connected.
3. Remove a tape top sensor assembly. (Refer to Section 3-17.)
4. Remove a threading motor. (Refer to Section 3-17.)
5. Remove a pinch roller guide shown in the figure from 2 shafts upon pulling it upward.
6. After removing a screw and flat washer which are holding a pull-rod holding plate, remove the pull-rod holding plate. Place removed the pull-rod holding plate in the position close to the cassette sensor.



7. By referring to the procedure for replacement of threading ring (Section 3-21), lift up the threading ring in the neighborhood of a gear block for about 5 cm.

**Note:** Be careful not to cause damage to the drum, stationary head and tape guide etc.

8. Remove four screws holding the gear block and a screw holding a condensation sensor, and lift the gear block from the unit.
9. Disconnect two connectors of CN501 and CN502 connected with SE-164 board of the gear block.



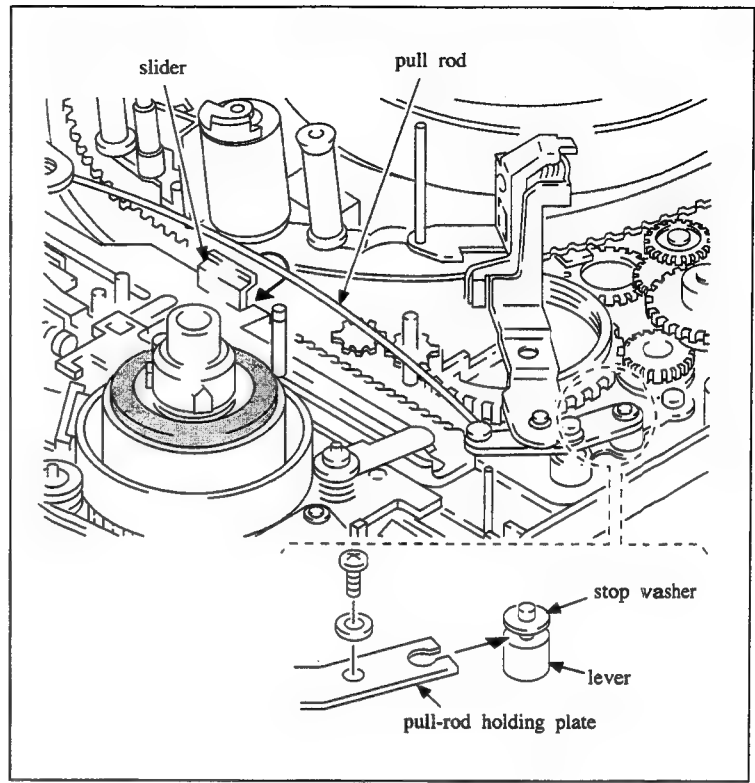


### Installation

10. Connect two connectors with a new gear block.
11. Install the gear block with three screws while pushing it toward cabinet side, and install the condensation sensor with one screw.
12. Install the threading ring.  
(Refer to Section 3-21.)

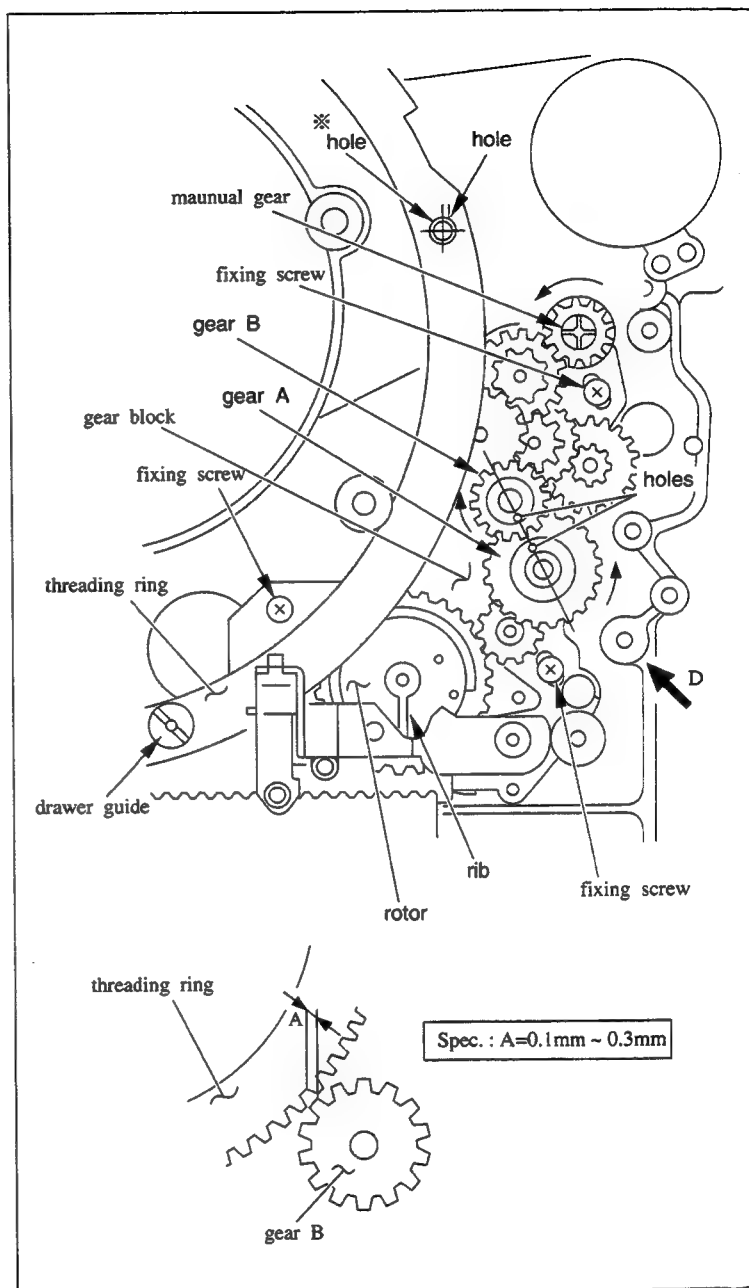
**Note:** Be careful not to cause damage to the drum, stationary head and tape guide etc.

13. Insert the central portion of pull-rod under the holder of the slider.
14. Insert the notch of the pull-rod holding plate between a lever of the gear box and stop washer.
15. Install the pull-rod holding plate with flat washer and one screw.
16. Install the pinch roller guide.



### Adjustment after replacement

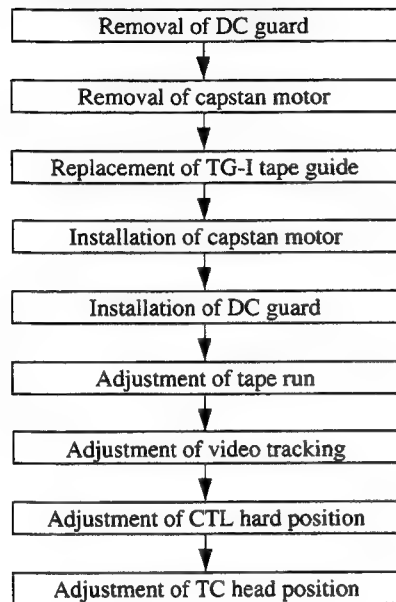
17. Perform the threading ring rotation adjustment.  
(Refer to Section 3-21.)
18. Smear grease to the inside edge of the threading ring as much as to create a thin film of grease.  
(Refer to Section 3-21.)
19. Perform the **gear assembly engagement adjustment**.
  - (1) Put the slider into threading end state. Rotate the threading ring manually, align the \* marked hole in the figure with the hole of chassis.
  - (2) Rotate a manual gear with a philips type screwdriver 2mm dia. and place the rotor rib with face down as shown in the figure.
  - (3) Align the holes of a gear A with gear B as shown in the figure.
  - (4) Rotate the gear A gently with finger in the direction of arrow. Adjust the position of gear block by pushing it in the direction of arrow D so that the clearance between the gear B and threading ring satisfies the required specification.
  - (5) Tighten the gear block with four screws.
  - (6) Rotate the threading ring into threading and unthreading operations by turning the manual gear, check that the drawer guide roller on the threading ring dose not contact with a slant guide. If contacts, shift one tooth of the gear B to the clockwise direction against the threading ring. Check again to satisfies the specification.
  - (7) Rotate the manual gear and perform sub-step (2) through (4) to make sure that the specification is satisfied.
20. Install the threading motor.  
(Refer to Section 3-17.)
21. Install the tape top sensor assembly.  
(Refer to Section 3-17.)
22. Clean the pinch roller, tape guide, drum, stationary head and capstan shaft etc. with a cleaning piece moistened with cleaning fluid.
23. Install the right and left hinge of VR lid.
24. Perform pull-rod position adjustment.  
(Refer to Section 3-8.)
25. Perform tape run adjustment.  
(Refer to Section 4-2-1 through 4-2-6.)
26. Perform FWD back tension adjustment.  
(Refer to Section 3-8.)
27. Perform video tracking adjustment.  
(Refer to Section 4-3.)



### 3-23. TG-I TAPE GUIDE REPLACEMENT

The service for TG-I tape guide is provided for the replacement of TG-I tape guide whole assembly instead of replacement of the component parts.

#### Replacement flow chart



#### Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01

### Removal

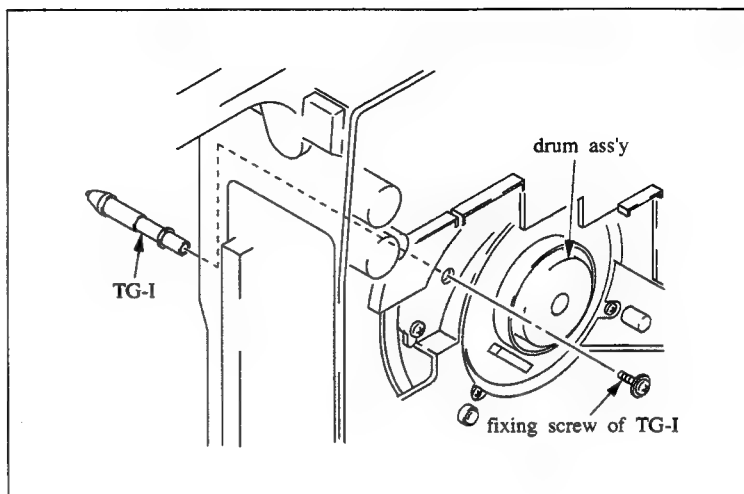
1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Open a side panel. (Refer to Section 1-12.)
3. Open VO-34P board. (Refer to Section 1-13.)
4. Remove a DC guard. (Refer to Section 3-4.)
5. Disconnect the connector CN301 connected with a capstan motor board.
6. Rotate the upper drum with finger, and place the video head not too close to the Audio/TC head.
7. Stand the unit keeping a connector box down.
8. Remove a capstan motor.  
(Refer to Section 3-29.)
9. Remove a screw (PS 2.6 x5) shown in the figure, and remove a TG-I tape guide.

### Installation

10. Clean the installation surface of the TG-I tape guide of chassis and a new TG-I tape guide with a cleaning piece moistened with cleaning fluid.
11. Install a new TG-I tape guide.
12. Install the capstan motor.  
(Refer to Section 3-29.)
13. Connect the connector CN301 with capstan motor board.
14. Install the DC guard. (Refer to Section 3-4.)
15. Close VO-34P board, and install it with two screws. (Refer to Section 1-13.)
16. Close the side panel. (Refer to Section 1-12.)
17. Clean the tape running surface of the capstan shaft and Audio/TC head etc.

### Adjustment after replacement

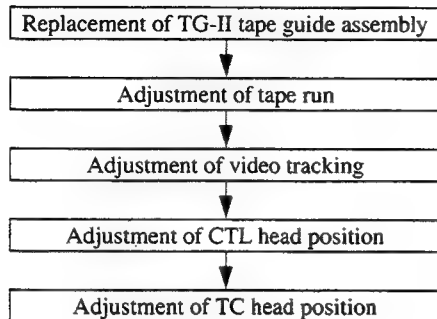
18. Perform tape run adjustment.  
(Refer to Section 4-2-1 through 4-2-6.)
19. Perform video tracking adjustment.  
(Refer to Section 4-3.)
20. Perform CTL head position adjustment.  
(Refer to Section 4-8.)
21. Perform TC head position adjustment.  
(Refer to Section 4-12.)



### 3-24. TG-II TAPE GUIDE REPLACEMENT

The service for TG-II tape guide is provided for the replacement of TG-II tape guide whole assembly instead of replacement of component parts.

#### Replacement flow chart



#### Tools

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01

#### Removal

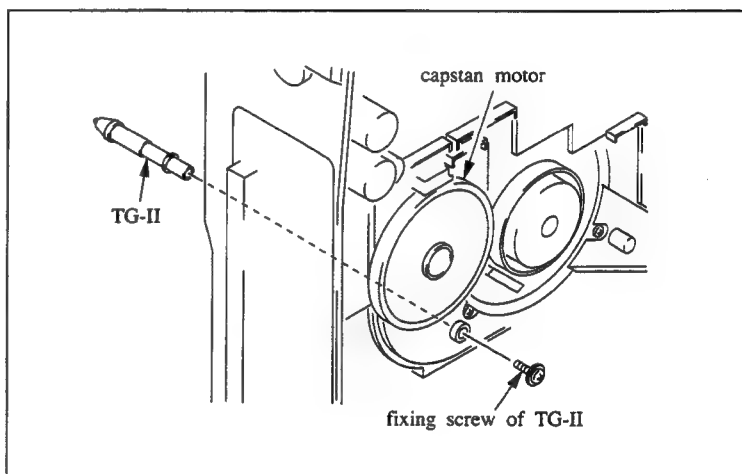
1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Open a side panel. (Refer to Section 1-12.)
3. Open VO-34P board. (Refer to Section 1-13.)
4. Stand the unit keeping a connector box down.
5. Remove a screw (PS 2.6x5) and, remove a TG-II tape guide assembly.

#### Installation

6. Clean the installation surface of the TG-II tape guide of chassis and a new TG-II tape guide with a cleaning piece moistened with cleaning fluid.
7. Install a new TG- II tape guide.
8. Close VO-34P board, and install it with two screws. (Refer to Section 1-13.)
9. Close the side panel. (Refer to Section 1-12.)

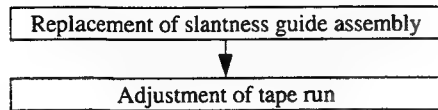
#### Adjustment after replacement

10. Perform tape run adjustment.  
(Refer to Section 4-2-1 through 4-2-6.)
11. Perform video tracking adjustment.  
(Refer to Section 4-3.)
12. Perform CTL head position adjustment.  
(Refer to Section 4-8.)
13. Perform TC head position adjustment.  
(Refer to Section 4-12.)



### 3-25. SLANTNESS GUIDE ASSEMBLY REPLACEMENT

#### Replacement flow chart

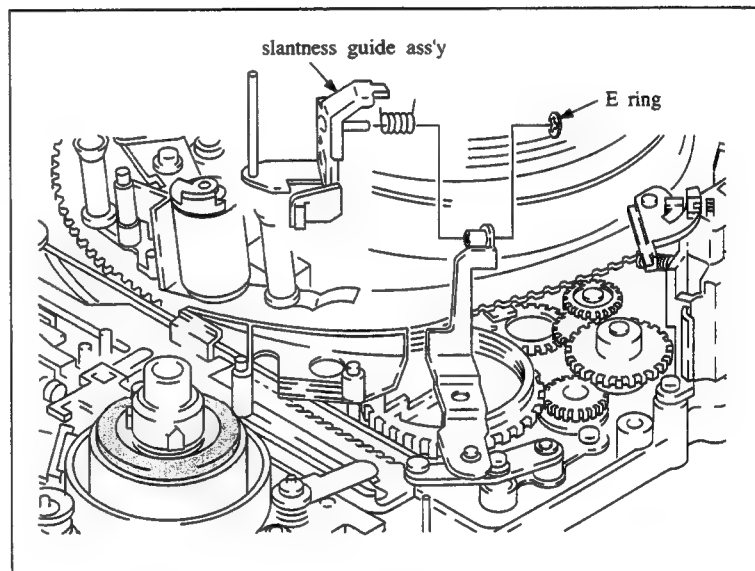


#### Tools

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01

#### Removal and installation

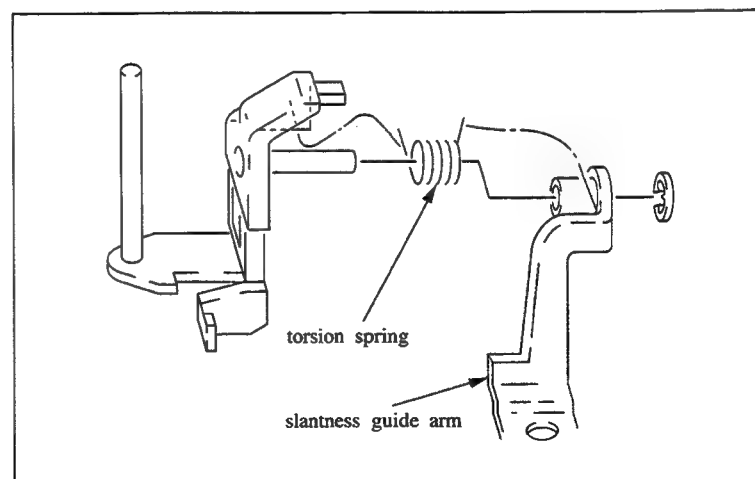
1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Remove an E ring shown in the figure, and remove the slantness guide assembly.



3. Hook a torsion spring on it as shown in the figure, and install it to the slantness guide arm.
4. Clean the slantness guide with a cleaning piece moistened with cleaning fluid.

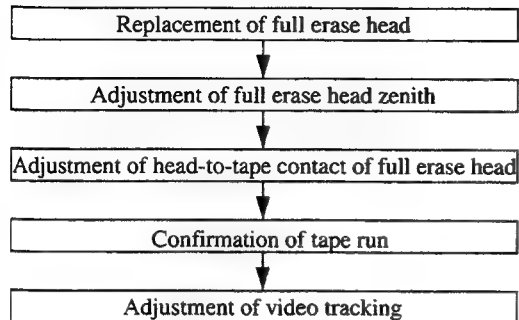
#### Adjustment after replacement

5. Perform tape run adjustment. (Refer to Section 4-2-3, 4-2-5 and 4-2-6.)



### 3-26. FULL ERASE HEAD REPLACEMENT

#### Replacement flow chart



#### Tools

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01

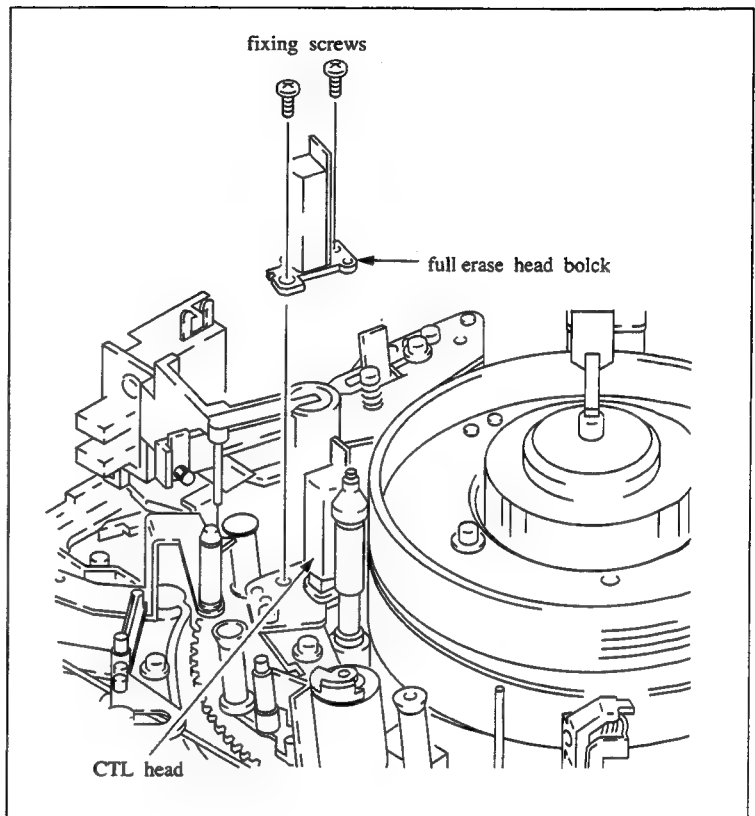
#### Removal

1. Unsolder the connector CN504 of the upper part of an full erase head.
2. Remove two screws as shown in the figure, and remove the full erase head block.

**Note 1:** Be careful not to cause damage to the drum when removing the full erase head block.

**Note 2:** Be careful not to drop the screws inside of the unit during removal.

3. Remove one screw from the full erase block, and remove an full erase head.



### Installation

4. Install a new full erase head to a head bracket with one screw while pressing it in the direction shown in the figure.
5. Align the hole of the head bracket with the protrusion of CTL head block.
6. Install the full erase head block to CTL head block with two screws.

At that time, thread the screw in the front of head snugly but do not tighten. (It will be used for adjustment after replacement.)

**Note 1:** Use the screw of PS 2x5 for the rear of head.  
Use the screw of B 2x4 for the front of head.

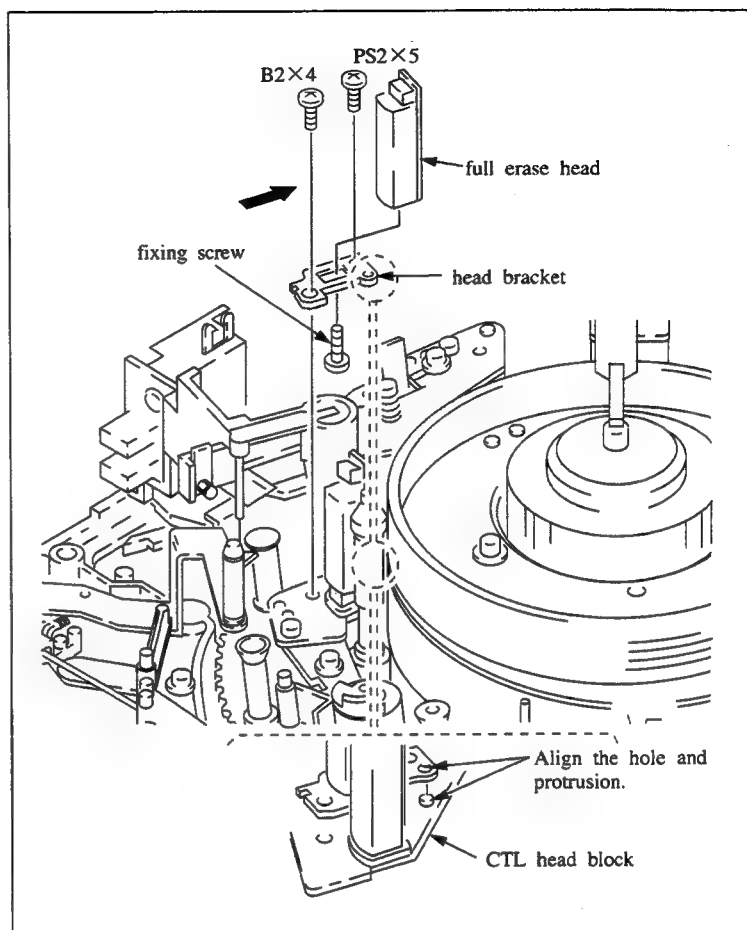
**Note 2:** Pay particular attention not to cause damage to the drum when installing the full erase head block.

**Note 3:** Pay particular attention not to drop the screws inside of the unit during installation.

7. Solder the connector CN504.
8. Clean the full erase head with a cleaning piece moistened with cleaning fluid.

### Adjustment after replacement

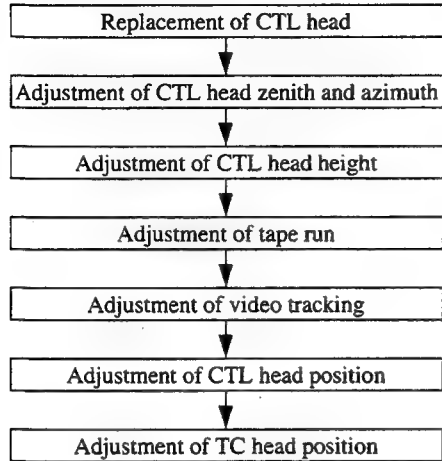
9. Perform full erase head zenith adjustment. (Refer to Section 4-4.)
10. Perform head-to-tape contact adjustment of the full erase head. (Refer to Section 4-5.)
11. Perform tape run adjustment. (Refer to Section 4-2-3 and 4-2-6.)
12. Perform video tracking adjustment. (Refer to Section 4-3.)





### 3-27. CTL HEAD REPLACEMENT

#### Replacement flow chart

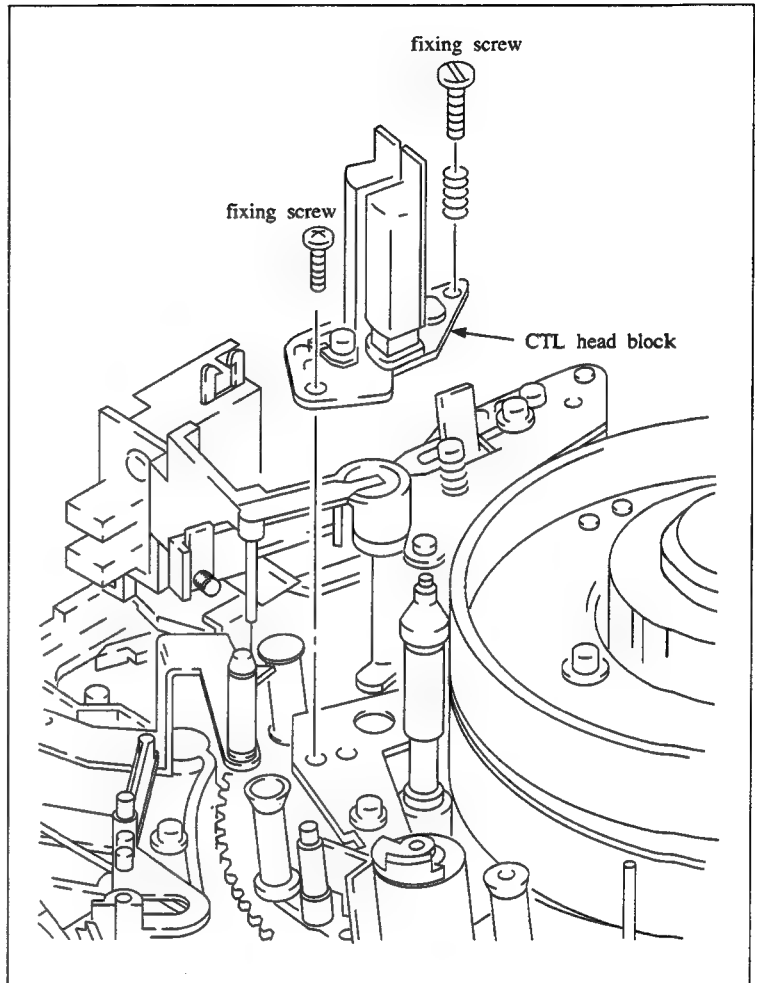


#### Tools

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01

#### Removal

1. Remove two screws as shown in the figure, and remove a CTL head block from the unit.  
**Note:** Be carefull not to cause damage to drum when the CTL head block is removed.
2. Unsolder the connector from the CTL head board.
3. Remove two screws from the rear of the CTL head block, and remove a CTL head.



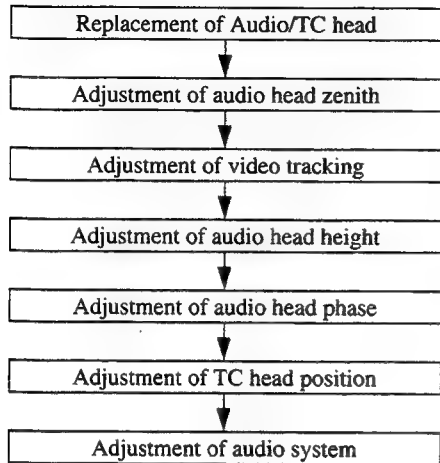
4. Install a

- ### Adjustment after replacement

- 
- CTL head
- CTL head block
- fixing screws

### 3-28. AUDIO/TC HEAD REPLACEMENT

#### Replacement flow chart



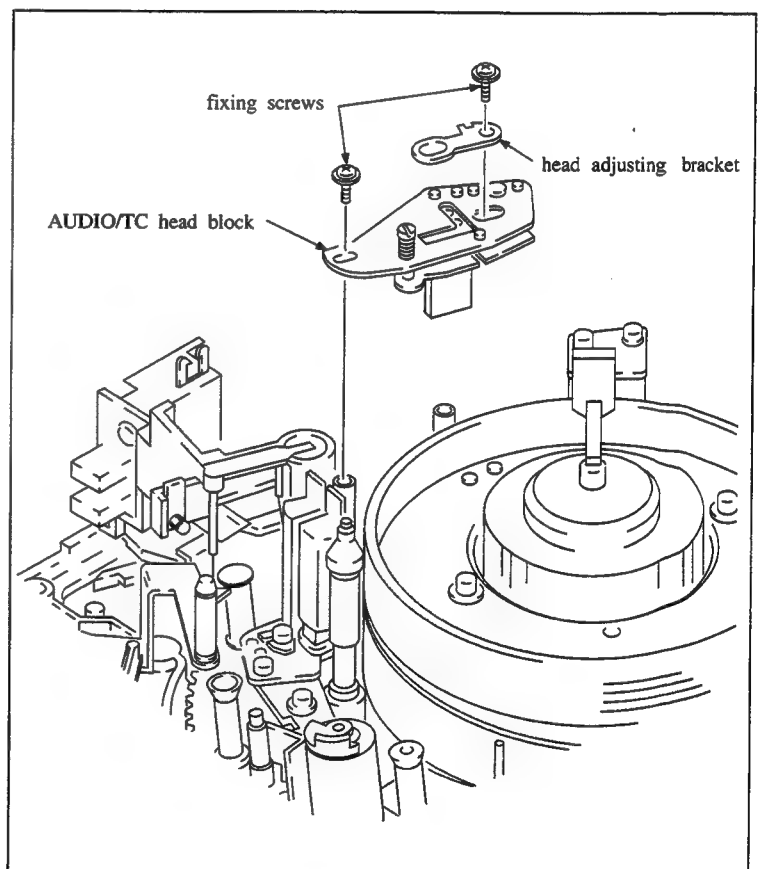
#### Tool

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01

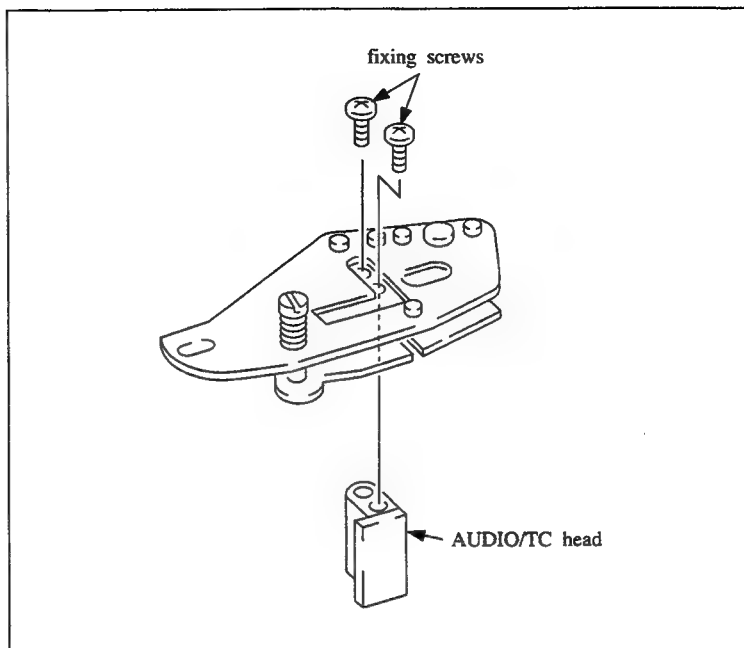
#### Removal

1. Rotate an upper drum with finger, and place the video head not too close to an Audio/TC head.
2. Disconnect the harness connector CN006 on both MB-363 and AU-144P boards which comes from the Audio/TC head.
3. Remove two screws as shown in the figure, and remove the Audio/TC head. Head adjusting bracket is also detached simultaneously.

**Note:** Be carefull not to cause damage to the drum when the Audio/TC head block is removed.



4. Remove two screws as shown in the figure, and remove the Audio/TC head.
5. Unsolder the harness from the Audio/TC head.

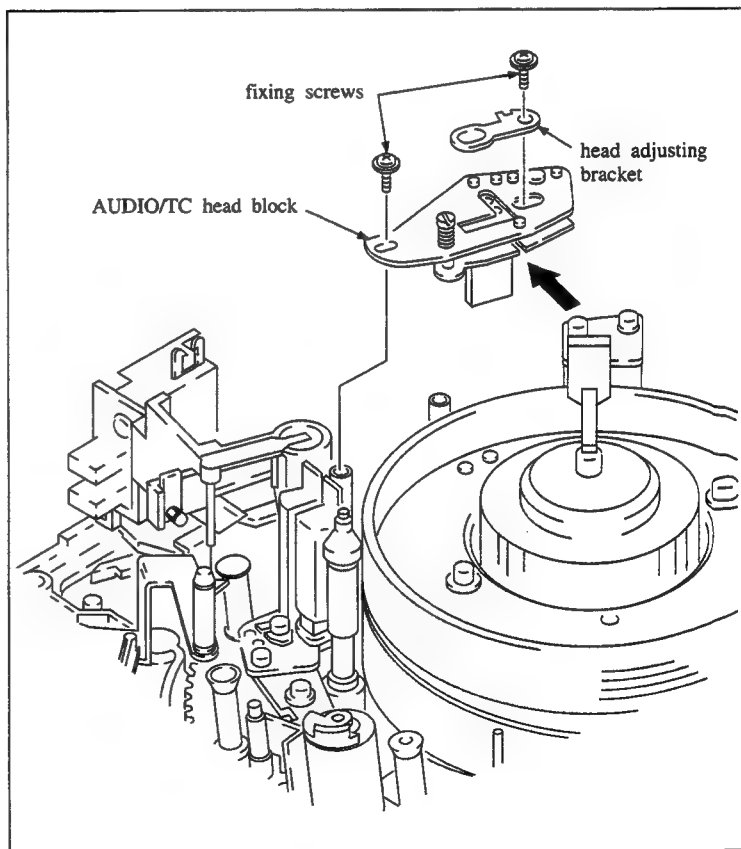


#### Installation

6. Install a new Audio/TC head to the head bracket in the order indicated in the figure, and fasten it with two screws snugly, but do not tighten.
7. Tighten the screws while pressing the Audio/TC head in the direction of arrow.
8. Install the Audio/TC head block and head adjustment bracket to the unit with two screws.  
**Note:** Be careful not to cause damage to the drum during installation.
9. Connect the harness connectors CN006 and CN6 of the Audio/TC head block with MB-363 and AU-144P boards respectively.

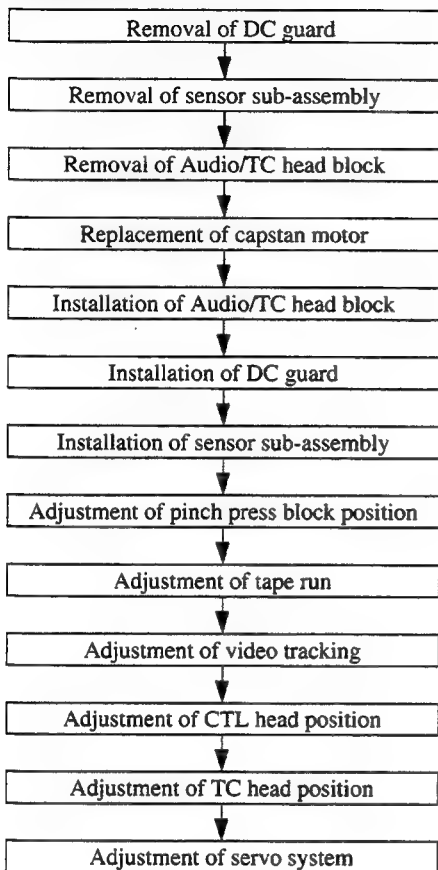
#### Adjustment after replacement

10. Perform audio head zenith adjustment.  
(Refer to Section 4-9.)
11. Perform video tracking adjustment.  
(Refer to Section 4-3.)
12. Perform audio head height adjustment.  
(Refer to Section 4-10.)
13. Perform audio head phase adjustment.  
(Refer to Section 4-11.)
14. Perform CTL head position adjustment.  
(Refer to Section 4-8.)
15. Perform TC head position adjustment.  
(Refer to Section 4-12.)
16. Perform audio adjustment.  
(Refer to section 5-2-2.)



### 3-29. CAPSTAN MOTOR REPLACEMENT

#### Replacement flow chart



#### Tools

Cleaning piece : 2-034-697-00  
Cleaning fluid : 9-919-573-01

#### Removal

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Open a side panel. (Refer to Section 1-12.)
3. Open VO-34P board. (Refer to Section 1-13.)
4. Remove a DC guard. (Refer to Section 3-4.)
5. Disconnect the connector CN301 connected with a capstan motor board.
6. Remove a sensor sub-assembly. (Refer to Section 3-20.)
7. Rotate an upper drum with finger, and place the video head not too close to an Audio/TC head.

8. Remove an Audio/TC head block.  
(Refer to Section 3-28.)
9. Stand the unit keeping a connector box down.
10. Remove two screws as shown in the figure and remove a capstan motor.

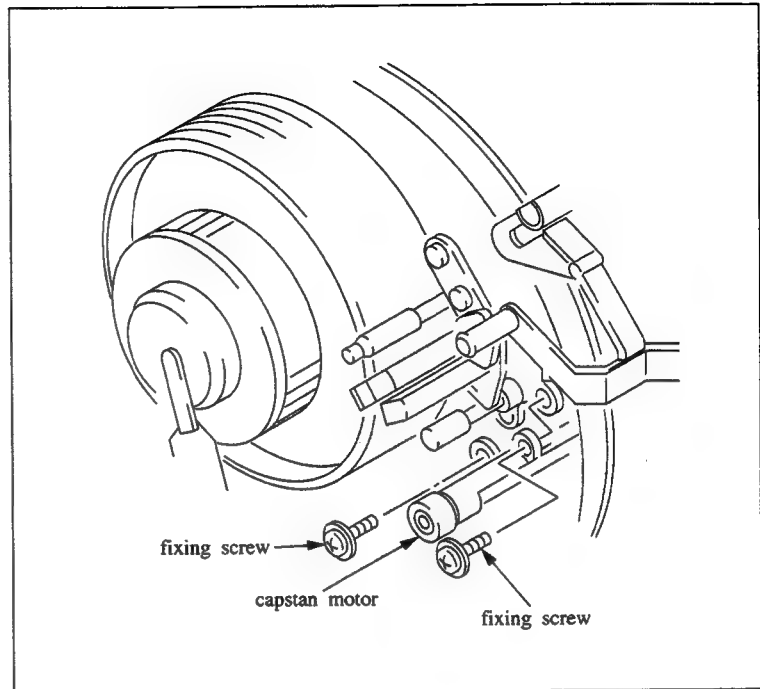
**Note:** Be carefull not to cause damage to the inner circumference etc. of threading ring when capstan motor is removed.

#### Installation

11. Clean the installation surfaces of chassis and a new capstan motor with a cleaning piece moistened with cleaning fluid.
12. Install a new capstan motor.  
**Note:** Be careful not to cause damage to the capstan motor shaft by inner circumference etc. of threading ring when the capstan motor is installed.
13. Install the new capstan motor with two screws.
14. Connect the connector CN301 with the capstan motor board.
15. Install the Audio/TC head block.  
(Refer to Section 3-28.)
16. Install the DC guard. (Refer to Section 3-4.)
17. Close VO-34P board; and install it with two screws. (Refer to Section 1-13.)
18. Close the side panel. (Refer to Section 1-12.)
19. Clean the tape running surface such as the capstan motor shaft and Audio/TC head etc.
20. Install the sensor sub-assembly.  
(Refer to Section 3-20.)

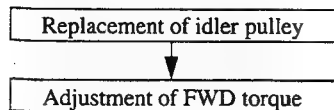
#### Adjustment after replacement

21. Perform pinch press block position adjustment.  
(Refer to Section 3-20.)
22. Perform tape run adjustment.  
(Refer to Section 4-2-3,4-2-4 and 4-2-6.)
23. Perform video tracking adjustment.  
(Refer to Section 4-3.)
24. Perform CTL head position adjustment.  
(Refer to Section 4-8.)
25. Perform TC head position adjustment.  
(Refer to Section 4-12.)
26. Perform servo adjustment.  
(Refer to Section 5-2-3.)



### 3-30. IDLER PULLEY ASSEMBLY REPLACEMENT

#### Replacement flow chart



#### Tools

Cleaning piece : 2-034-697-00

Cleaning fluid : 9-919-573-01

FWD back tension measuring cassette

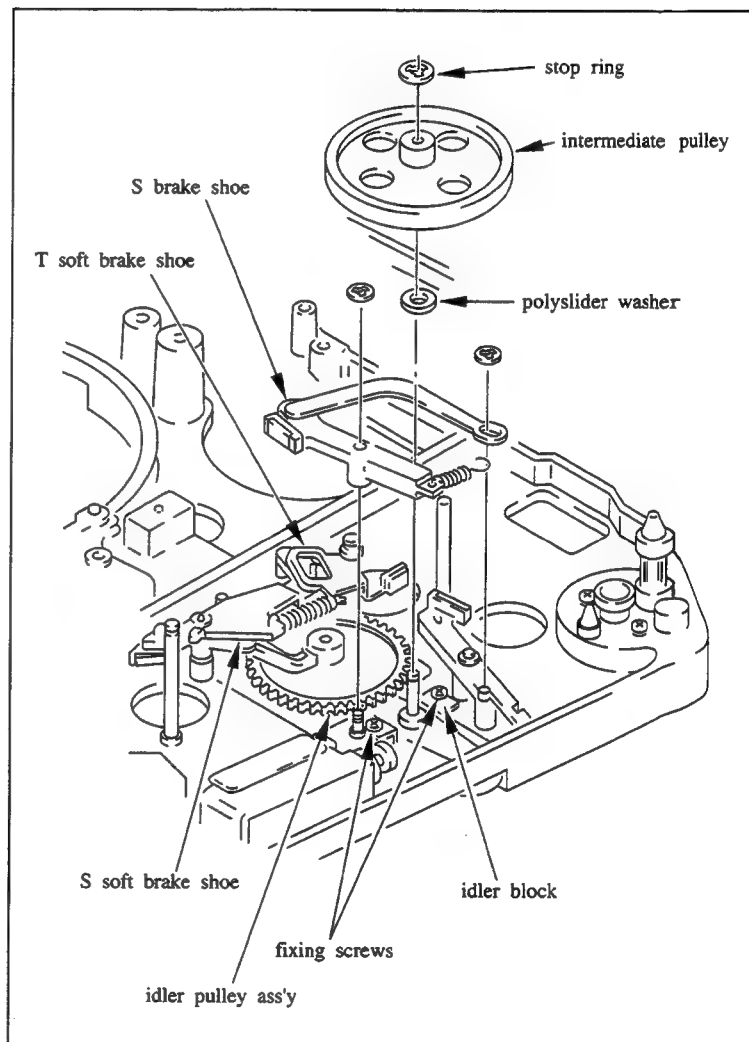
:J-6080-003-C

Cassette tape without lid

(tape beginning portion)(BCT-20M)

#### Removal

1. Make sure that the unit is in unthreading end state. (Refer to Section 3-1.)
2. Open a side panel. (Refer to Section 1-12.)
3. Remove a reel belt. (Refer to Section 3-5.)
4. Remove a stop ring above a intermediate pulley.
5. Remove the intermediate pulley.
6. Remove a S brake shoe. (Refer to Section 3-9.)
7. Remove a S soft brake shoe. (Refer to Section 3-11.)
8. Remove a T soft brake shoe. (Refer to Section 3-12.)
9. Remove two screws shown in the figure, and remove an idler block then remove polyslider washer and an idler pulley assembly.



## Installation

10. Install a new idler pulley assembly and polyslider washer to the shaft of the idler block.
11. Install the idler block with two screws.
12. Install the T soft brake shoe.  
(Refer to Section 3-12.)
13. Install the S soft brake shoe.  
(Refer to Section 3-11.)
14. Install the S brake shoe. (Refer to Section 3-9.)
15. Insert the intermediate pulley into the shaft, and fix it to the shaft with stop ring.

**Note:** In case of the stop ring is deformed, be sure to replace it with a new one.

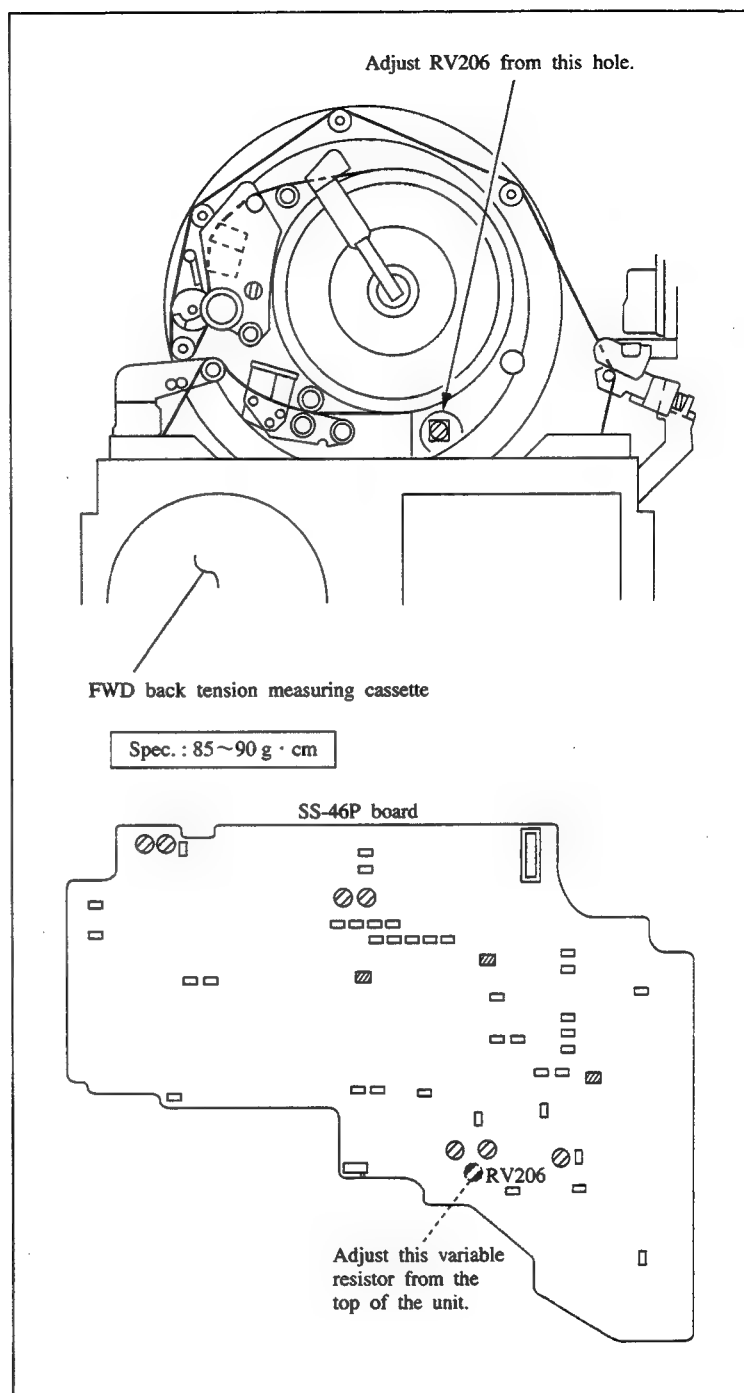
Parts No.: 3-669-465-00

16. Clean the reel belt with a cleaning piece moistened with cleaning fluid.
17. Install the reel belt. (Refer to Section 3-5.)

## Adjustment after replacement

### 18. Perform the FWD torque adjustment.

- (1) Put the switch S5 on SS-46P board in "SLACK MUTE ON" state.
- (2) Insert the FWD back tension measuring cassette without lid, at the tape beginning portion, and put it into PLAY mode.
- (3) Adjust RV206 on SS-46P board, through the hole on upper surface of the chassis as shown in the figure, so that the value at take-up side of measuring cassette satisfies the required specification.
- (4) Make sure once again that the specification is satisfied by rewinding measuring cassette to its tape beginning.
- (5) After the adjustment, be sure to put the switch S5 on SS-46P board to "SLACK MUTE OFF" state.





## SECTION 4

### TAPE RUN ALIGNMENT

#### 4-1. INFORMATION FOR TAPE RUN ALIGNMENT

##### 1. How to make a cassette tape without lid

Since this unit is designed to be compact, the check and adjustment cannot be performed if a cassette tape lid is installed. Remove the cassette tape lid as follows:

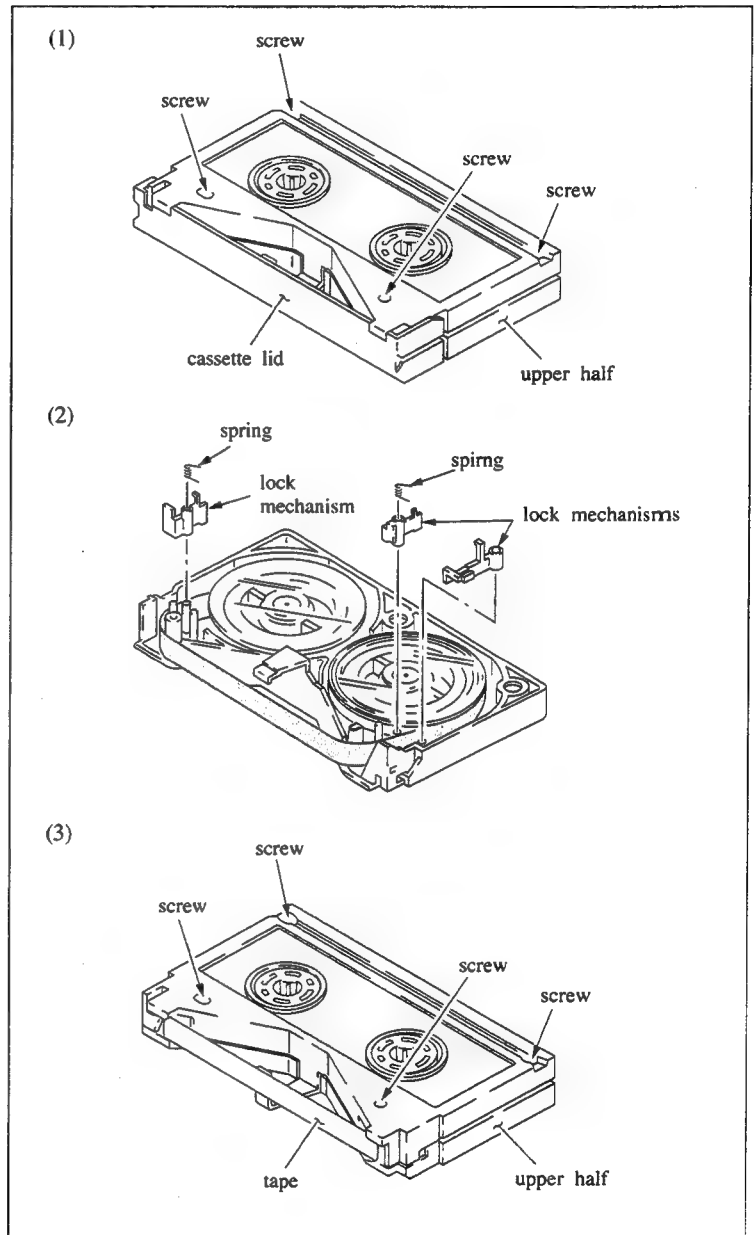
- (1) Remove four screws on the back of the cassette tape as shows in the figure, and remove an upper half of the cassette.
- (2) Remove the lock mechanism parts and springs both at right and left sides, and remove the cassette lid from the upper half.
- (3) Install the upper half on the lower half with four screws from the back side.

##### 2. Alignment Tape

The alignment tapes to be used for tape run adjustment are as follows.

CR2-1B PS: 8-960-096-51  
CR5-2A PS: 8-960-098-44  
CR8-1A PS: 8-960-098-45

**Note:** When an oxide tape is installed in this unit, the cassette tape is ejected forcibly. Above mentioned alignment tapes CR5-2A PS and CR8-1A PS are used the oxide tape. When performing adjustment and/or check using these tapes, put the switch S5 on SS-46P board in "SLACK MUTE ON" state. Then above mentioned alignment tapes can be played back. After adjustment and/or check is completed, return the switch S5 in "SLACK MUTE OFF" state.

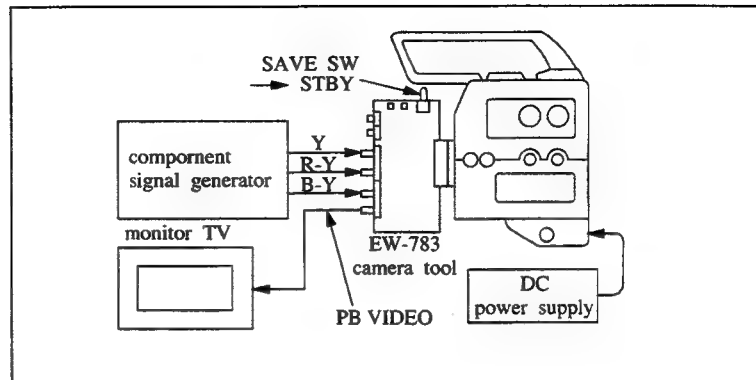


### 3. Tools for adjustment

While there are several types of adjustment tool available for use in Section 4., here is the explanations about the special tools in this Section.

- (1) When performing the repair and adjustment on the VTR without camera connected with it, exclusive tools are required.  
Parts No. J-6337-830-A  
Camera tool (EW-783)

The connecting method of VTR with exclusive tool is shown in the figure.



- (2) There are tools for the servo remote control (EW-229) and cable (EW-804) available to the adjustment work on the servo system adjustment and mechanical system adjustment.

Parts No.

Servo remote control tool(EW-229):

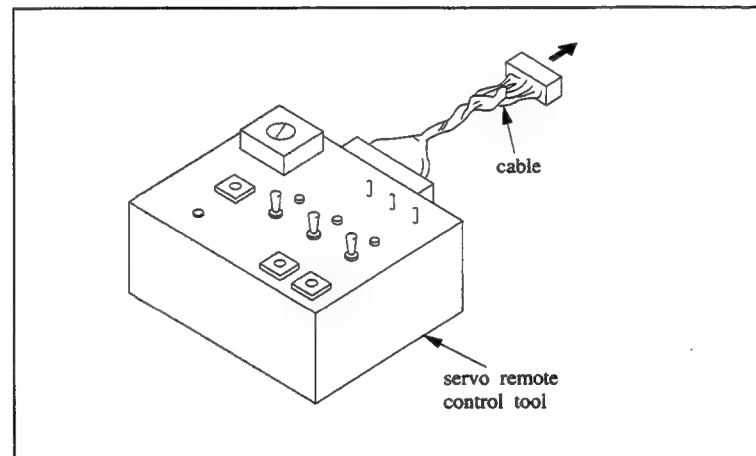
J-6332-290-A

Cable (EW-804):

J-6338-040-A

Meantime, the for servo remote control tool has been designed for the use of BVW-200P, BVW-300P and BVW-400P series VTR for broadcasters.

As such, it contains the additional function not utilized by PVV-1P. Here, is the explanation about the function applicable to PVV-1P use.



#### Connecting method

- (1) Connect 14-pin connector of cable (EW-804) with the tool.
- (2) Connect the connector of harness end with CN206 on SS-46P board of VTR.

#### Selection of mode

You can select any desirable mode by operating switch, push switch and rotary switch on operational surface of the tool.

**TRCON switch**

Put the rotary switch in 'F', then turn this switch to 'ON'. LED lights up, and tracking control becomes operatable by pushing button either of '+' or '-'.

When turning this switch to 'OFF' state, the just tracking state resumed.

By removing connector of tool from the VTR, the memory used for the adjustment is automatically cleared.

**SW POSITION switch**

Put the rotary switch in 'F', then turn to 'ON'. LED lights up and the switching position becomes variable by pushing button either of '+' or '-'.

**REC SERVO switch**

Put the rotary switch in 'F', then turn this switch to 'ON'. LED lights up and capstan servo circuit is in REC SERVO condition.

**REV button**

When pushing this button, VTR will be in REV mode. The unit put into the stop by pushing the STOP button of VTR.

**SW PULSE test point**

Switching pulse is output at this test point.

**CTL test point**

CTL signal is output at this test point.

### Rotary switch

By setting rotary switch on 'F' from 'O', it is possible to go to the mode in the following table.

. In addition, it may be required to mute slack detecting circuit depending upon the selective condition of the rotary switch. Muting of slack detecting circuit can be done by putting the S5 on SS-46P board in 'ON'.

### Mode

Rotary switch	Mode	For use
0	Select CH-A SW PULSE of Y	Being used to check CH-A head of Y.
1	Select CH-B SW PULSE of Y	Being used to check CH-B head of Y.
2	Select CH-A SW PULSE of C	Being used to check CH-A head of C.
3	Select CH-B SW PULSE of C	Being used to check CH-B head of C.
4	PAUSE mode	Being used to adjust the capstan stop servo because RF can be maintained in a non-continuous wave form by setting the capstan to the stop servo mode.
5		
6		
7	Stop rotation of the drum. (Mute the slack detection circuit.)	Stop the rotation of the drum by turning on each four drums to check the REC current for the drum head.
8	Capstan rotating at 1/2 speed	Confirmation of the servo operation
9	Capstan rotating at 1/6 speed	Confirmation of the servo operation
A		
B		
C	Adjust capstan FG DUTY mode	Rotate the capstan without applying servo to adjust the capstan FG DUTY.
D	Capstan free speed adjusting mode	Indicate instructions for measurement and adjustment for adjusting the capstan free speed.
E		
F	Normal mode	

(3) Tape guide adjustment driver

During tracking adjustment, rotate the flange on the tape guide in order to obtain the most desirable tape path. At that time, use the tape guide adjustment driver.

Tape guide adjustment driver:

J-6321-500-A

Here is the explanation about how to use the tape guide adjustment driver.

- (1) Align A portion (flatblade) with the groove of the tape guide flange.
- (2) Fix knob C, rotate knob B, then loosen locking screw.
- (3) Align the tip of knob B with the hole of locking screw of the tape guide flange. Fix knob B and rotate knob C. Then, the upper flange on tape guide is rotated.
- (4) In order to tighten the locking screw of the tape guide flange, firstly, fix the knob C, then rotate the knob B. (Tightening torque: 1.0 to 1.2 kg-cm)

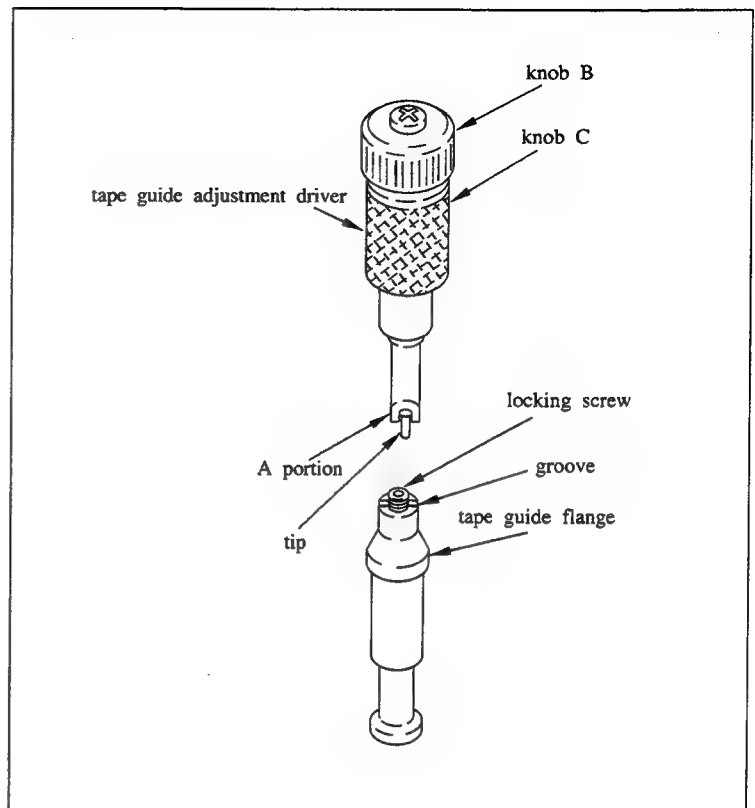
4. Mode

Here is the explanation about the method how to put the unit in the desirable mode while cassette compartment is attached and cassette tape is inserted, and also the same method when the cassette compartment is not attached.

- (1) You can put the unit easily in the mode stated in the items for adjustment according to the following method, in the case that the cassette compartment is attached and cassette tape is inserted.

In addition, as explained in the preceeding section, you can get various mode with use of servo remote control tool (EW-229) and cable (EW-804).

- PLAY: Push PLAY button on the unit.
- F.FWD: Push F.FWD button on the unit.
- REW: Push REW button on the unit.
- STOP: Push STOP button on the unit.
- EJECT: Push EJECT button on the unit.



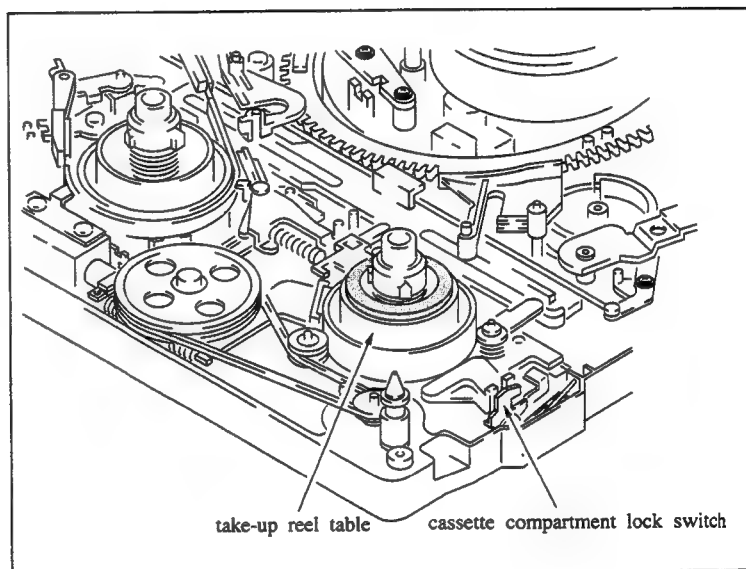
- (2) You can put the unit in the mode stated in the items for adjustment according to the following method in the case that the cassette compartment is not attached with and the cassette tape is not inserted in VTR.

**Threading end mode:**

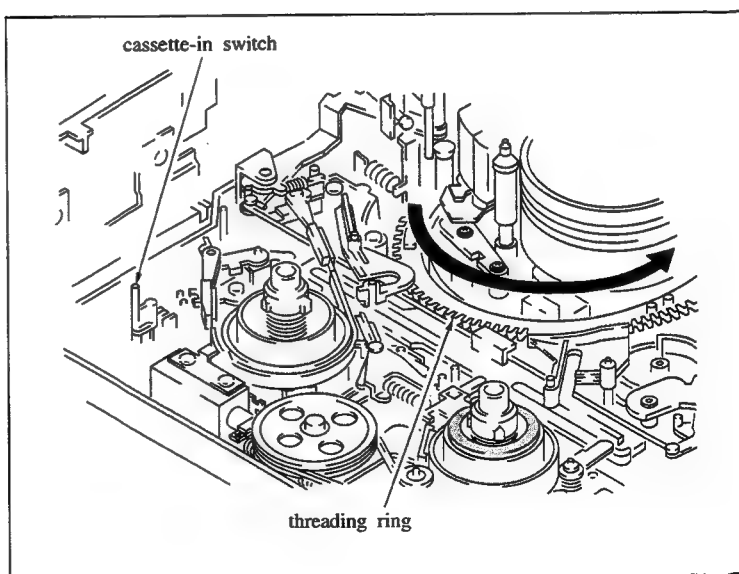
Threading end mode means that the threading ring rotates in the counterclockwise direction and stops. In order to put into the threading end mode:

**Method 1.**

- Turn the POWER switch ON.
- Push down a cassette compartment lock switch to get locked state.

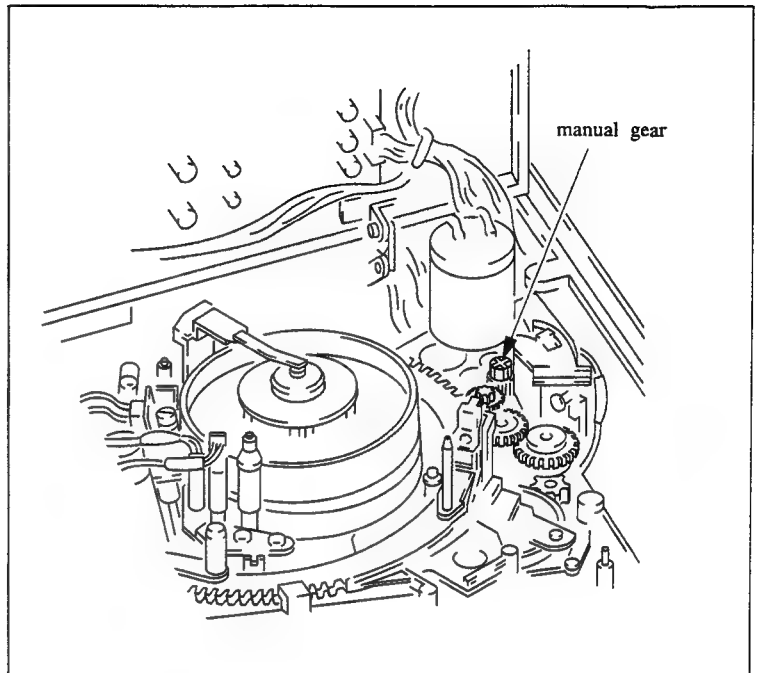


- Push a cassette in switch shown in the figure.
- Threading ring rotates in the counterclockwise direction and stops.

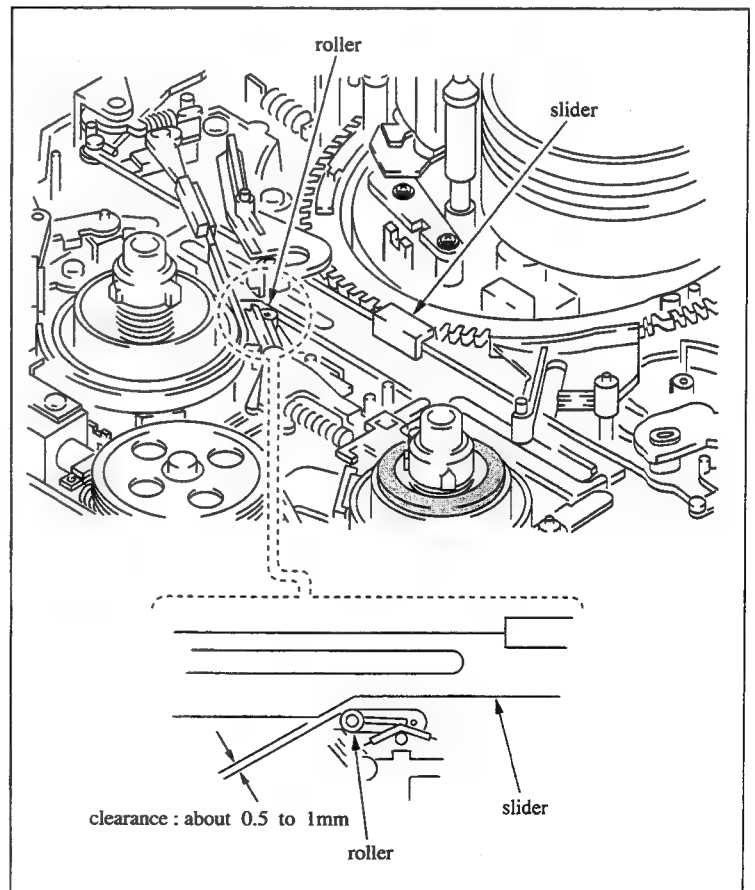


### Method 2

- Rotate a manual gear using a philips type 2mm dia. screwdriver in the clockwise direction.



- When a slider moves into the condition shown in the figure, stop rotating the screwdriver.



**Unthreading end mode:**

Unthreading mode is the same mode with EJECT completion and means that the threading ring rotates in the clockwise direction and stops.

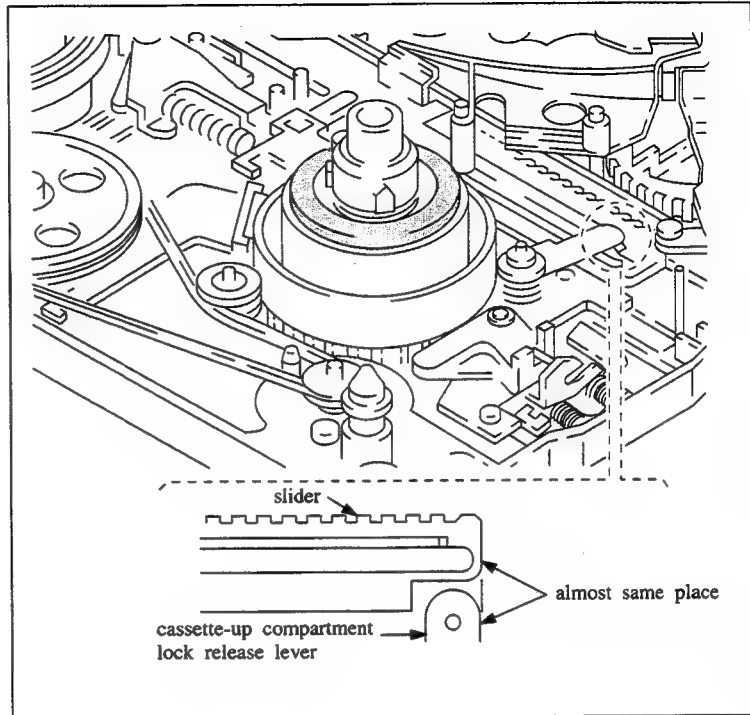
In order to put into the threading end mode:

**Method 1.**

- Push the EJECT button while in the threading end mode.

**Method 2.**

- Rotate the manual gear using a philips type 2mm dia. screwdriver in the counterclockwise direction.
- When the slider moves into the condition shown in the figure, stop rotating the screwdriver.





### STOP mode:

STOP mode is similar to the threading end mode in the aspect of mode, but the position of the slider is slightly different from the latter.

In order to put into STOP mode:

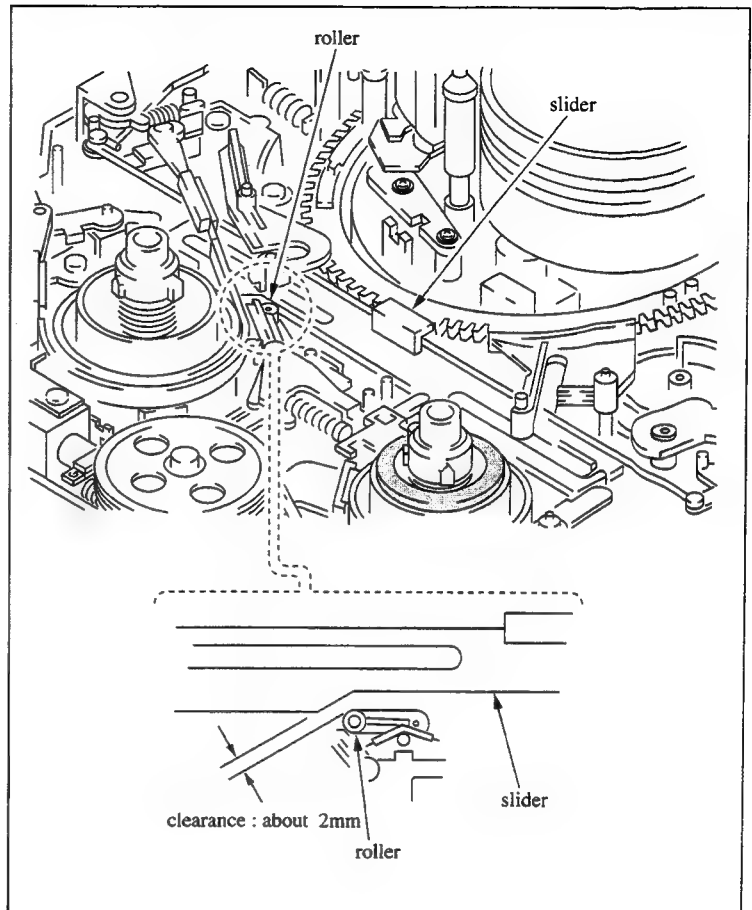
#### Method 1.

- Put the switch S5 on SS-46P board in "SLACK MUTE ON" state.
- Turn the POWER switch ON.
- Push down the cassette compartment lock switch to get locked state.
- Push the cassette in switch.
- Threading ring rotates in the counterclockwise direction and stops.
- Push the PLAY button to put into PLAY mode tentatively.
- Then push STOP button.

**Note:** After the completion of adjustment, be sure to put the switch S5 on SS-46P board back to "SLACK MUTE OFF" state.

#### Method 2.

- Rotate the manual gear using a philips type 2mm dia. screwdriver in the clockwise direction.
- When the slider moves to the condition shown in the figure, stop rotating the screwdriver.



**PLAY mode:**

PLAY mode means the mode where the pinch roller is pressed against the capstan shaft after STOP mode.

- In order to put into PLAY mode:

**Method 1.**

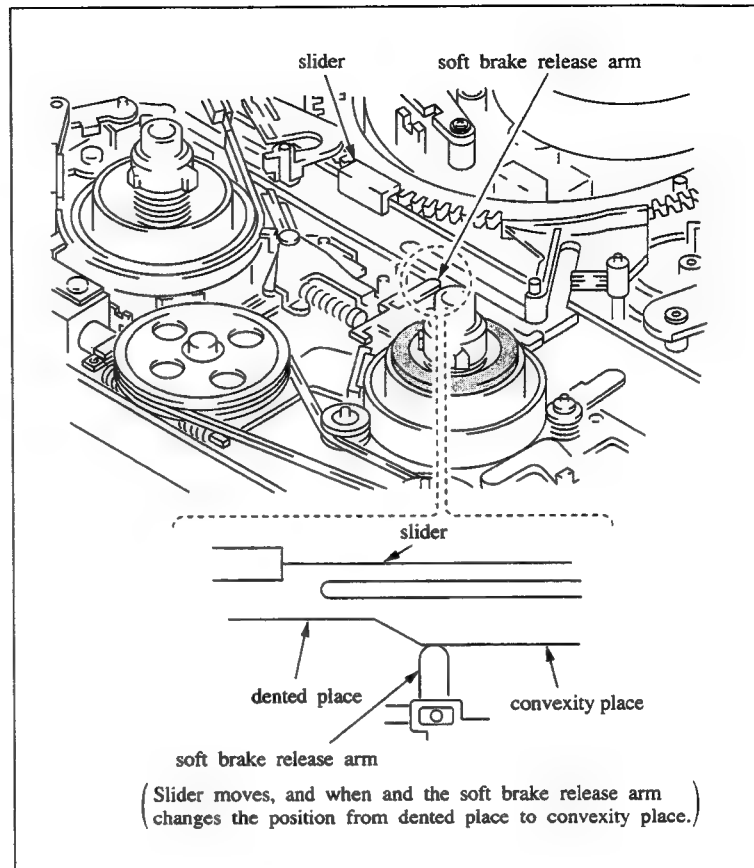
- Put the switch S5 on SS-46P board in "SLACK MUTE ON" state.
- Put the unit into STOP mode.
- Push the PLAY button.

**Note:** After the completion of adjustment, be sure to put the switch S5 on SS-46P board back to "SLACK MUTE OFF" state.

**Method 2.**

- Rotate the manual gear using a philips type 2mm dia. screwdriver in the clockwise direction, and put into the STOP mode.
- When the slider moves to the condition shown in the figure, stop rotating the screwdriver.

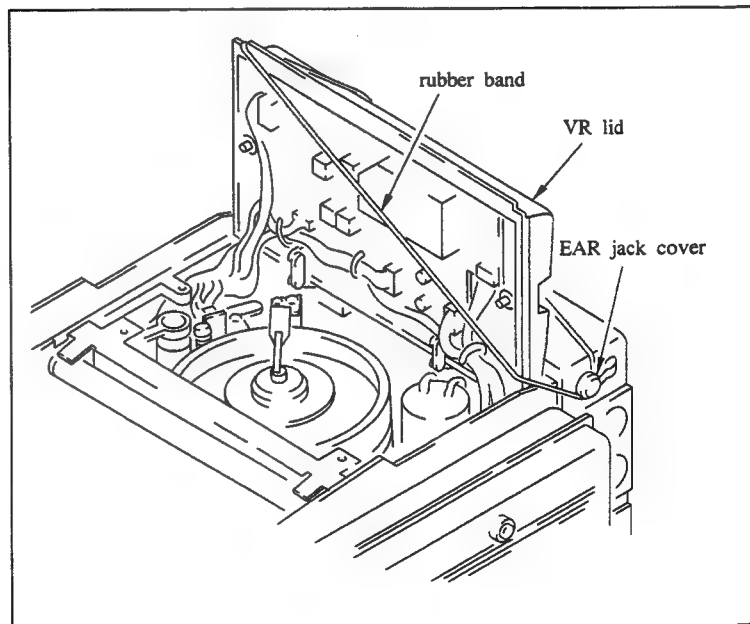
**Note:** Be sure not to rotate the gear further from this state, if rotate the gear further, the gear may be broken.



### 5. When performing tape run and video tracking adjustment

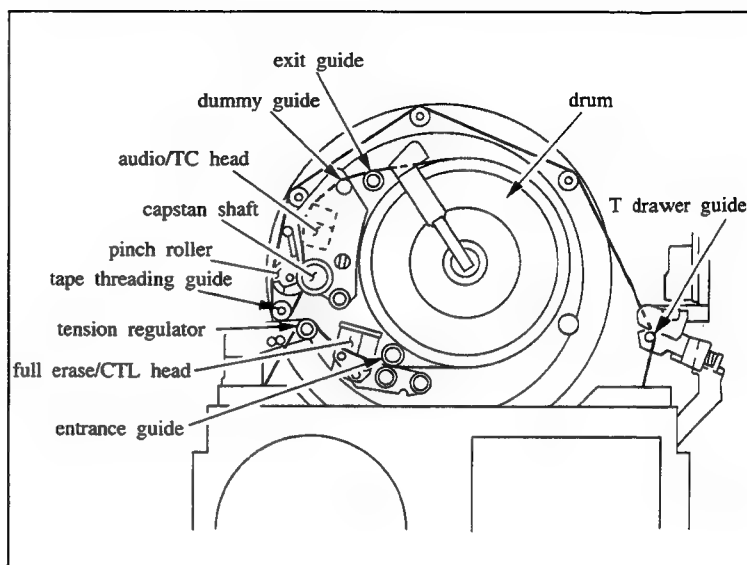
- (1) Turn the POWER switch OFF.
- (2) Remove the cassette-up compartment lid. (Refer to Section 1-12.)
- (3) Open a VR lid. (Refer to Section 1-12.)  
It is easier if the lid is fixed with a rubber band as shown in the figure to prevent the VR lid from closing while adjustment work is in progress.
- (4) Remove a tape retainer. (Refer to Section 3-2.)
- (5) Remove a cassette-up compartment. (Refer to Section 1-14.)

**Note:** The above item is omitted in the respective adjustment section.



## 6. Locations of heads and tape guides

The locations of heads and tape guides listed up in the adjustment item is shown in the figure.

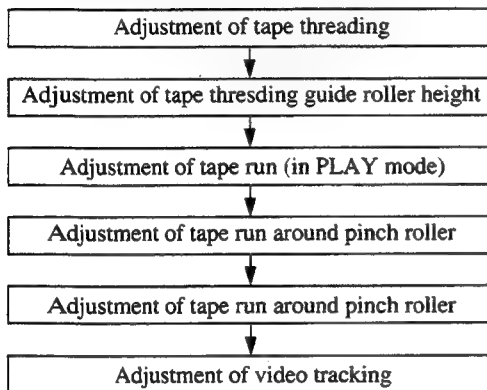


## 4-2. TAPE RUN ADJUSTMENT

- Adjustment of tape run is extremely important and critical adjustment for the purpose of running the tape in the most appropriate state.  
If this adjustment is not adequate, there is a possibility to damage the tape or cause serious damage to the unit.  
Take utmost care in performing adjustment.
- Perform this adjustment with cassette-up compartment attached as it is. By this way, accurate adjustment will be possible without difficulty as a service operation.

### 4-2-1. Tape Threading Adjustment

#### Adjustment flow chart



#### Tools

Cassette tape without lid (Tape beginning cassette/tape end cassette) (BCT-30M)  
Adjustment mirror: J-6080-029-A

#### Adjustment procedure

1. Insert a cassette tape without lid into the unit after winding for about one minute from tape beginning putting it in the threading mode.
2. Make sure that the specification 1 is satisfied during the tape threading (from cassette-in to threading end).

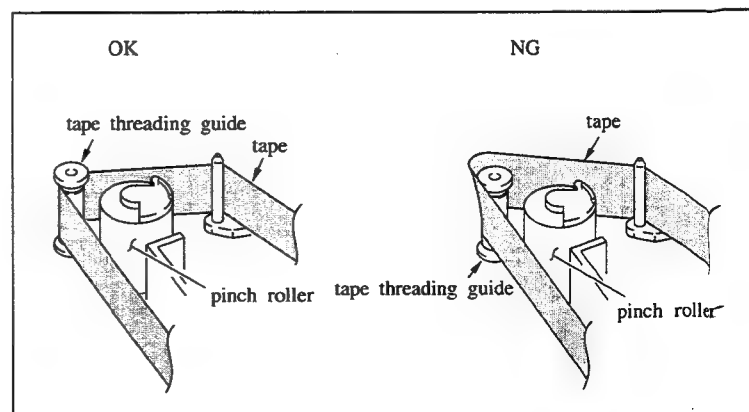
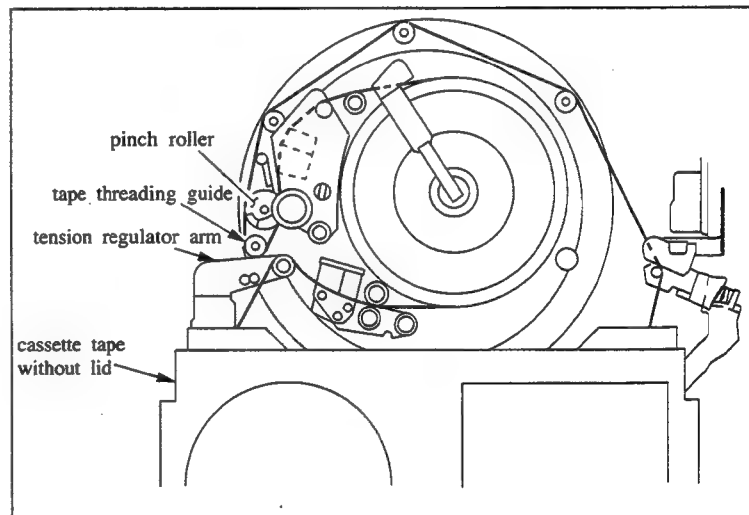
#### Specification 1:

Tape shall not run over the tape threading guide during threading.

Repeat step 2 for two to three times and make sure that the specification 1 is satisfied.

If the specification 1 is satisfied, perform step 3 and later.

If the specification is not satisfied, make sure once again after performing replacement of threading ring assembly and relative adjustment required.



3. Insert a cassette tape without lid in the unit after winding for about 3 minutes from tape end putting it in the threading mode.
4. Make sure that the specification 2 is satisfied during the tape threading (from cassette-in to threading end).

**Specification 2:**

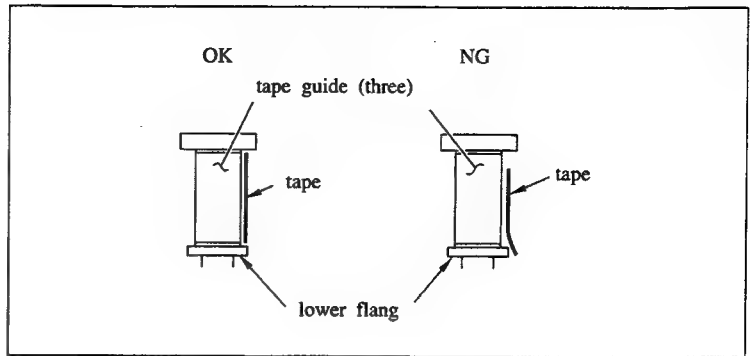
Tape shall not run over the flange of tape guide on the threading ring during threading.

Repeat step 4 for two to three times and make sure that the specification 2 is satisfied.

If the specification 2 is satisfied, perform step 5 and later.

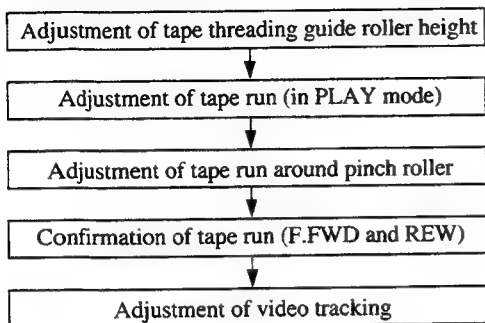
If the specification 2 is not satisfied, make sure once again after performing replacement of threading ring and relative adjustment required.

5. Perform tape threading guide roller height adjustment. (Refer to Section 4-2-2.)
6. Perform tape run adjustment(in PLAY mode). (Refer to Section 4-2-3.)
7. Perform tape tun adjustment around pinch roller. (Refer to Section 4-2-4.)
8. Perform tape run confirmation (F.FWD and REW). (Refer to Section 4-2-6.)
9. Perform video tracking adjustment. (Refer to Section 4-3.)



## 4-2-2. Tape Threading Guide Roller Height Adjustment

### Adjustment flow chart



### Tools

Cassette tape without lid (BCT-30M)

L shaped wrench (across flat has 0.89 mm):

7-700-736-06

Adjustment mirror: J-6080-029-A

### Adjustment

1. Insert a cassette tape without lid in the unit and put it into PLAY, F.FWD and REW modes.
2. Make sure using the adjustment mirror that, in every mode, lower edge of the tape runs in contact with the lower flange of the tape threading guide roller without any tape curl.

#### Specification 1:

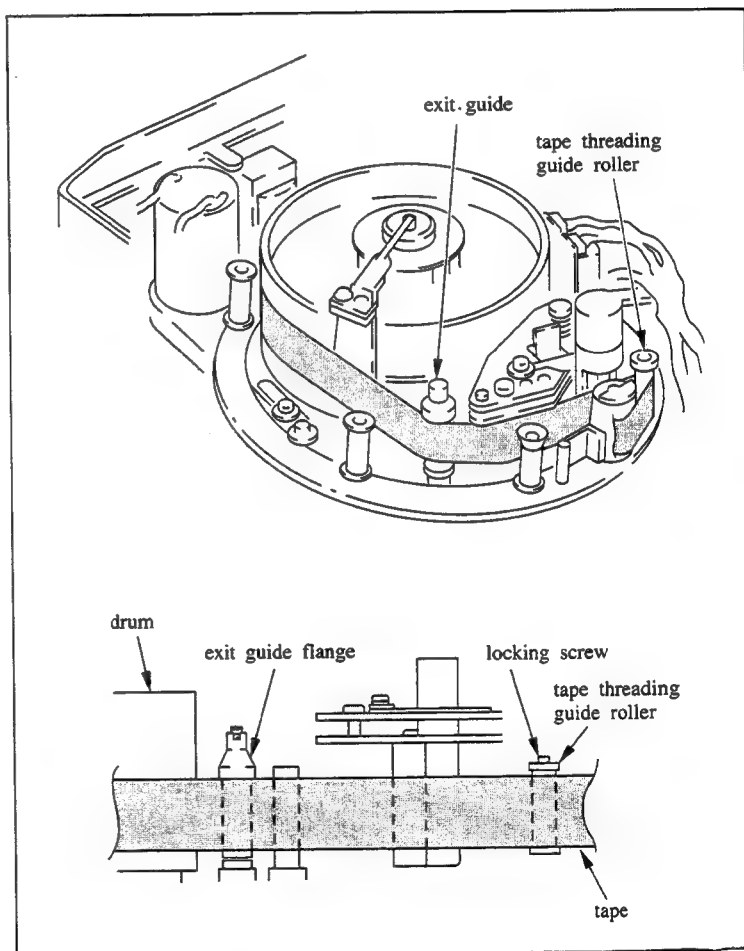
The lower edge of the tape runs in contact with the lower flange of the tape threading guide roller without any curl.

#### Specification 2:

There shall be a clearance between the upper flange of the tape threading guide roller and the upper edge of tape.

If the specifications are satisfied, perform step 7 and later.

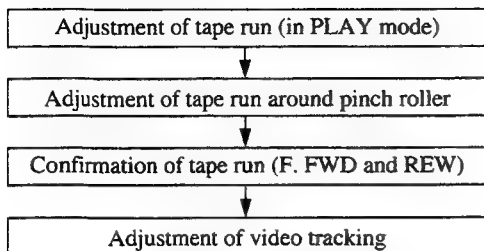
If the specifications are not satisfied, perform step 3 and later.



3. Loosen the locking screw of the upper flange of the tape threading guide roller for one to two turns using L shaped wrench (across flat has 0.89mm).
4. Put the unit into PLAY mode, and adjust it by rotating the upper flange of the tape threading guide roller to satisfy the required specifications.  
When rotating in clockwise direction:  
Tape threading guide roller moves downward.  
When rotating in counterclockwise direction:  
Tape threading guide roller moves upward.
5. Put the unit into F.FWD and REW modes, make sure that the tape runs in contact with the lower flange without any curl using the adjustment mirror.
6. Repeat the threading operation three or four times, and make sure that the tape does not run over an upper flange of the tape guide TG-II.
7. After the adjustment, tighten the locking screw of the upper flange of the tape threading guide roller and make sure once again.
8. Perform tape run adjustment (in PLAY mode). (Refer to Section 4-2-3.)
9. Perform tape run adjustment around pinch roller. (Refer to Section 4-2-4.)
10. Perform tape run confirmation (F.FWD and REW). (Refer to Section 4-2-6.)
11. Perform video tracking adjustment. (Refer to Section 4-3.)

#### 4-2-3. Tape Run Adjustment (in PLAY mode)

##### Adjustment flow chart



##### Tools

Cassette tape without lid (BCT-30M)

(Never use an alignment tape.)

Adjustment mirror : J-6080-029-A

Tape guide adjustment driver: J-6321-500-A

##### Adjustment

1. Insert a cassette tape without lid of BCT-30M into the unit.
2. Put the unit into PLAY mode.
3. Make sure using a adjustment mirror that the tape curl at each flange of a tension regulator roller and entrance guide roller satisfy the specification 1.

##### Specification 1:

No tape curl shall exist at each tape guide.

4. Make sure that tape curl at the lead of drum entrance part satisfies the specification 2.

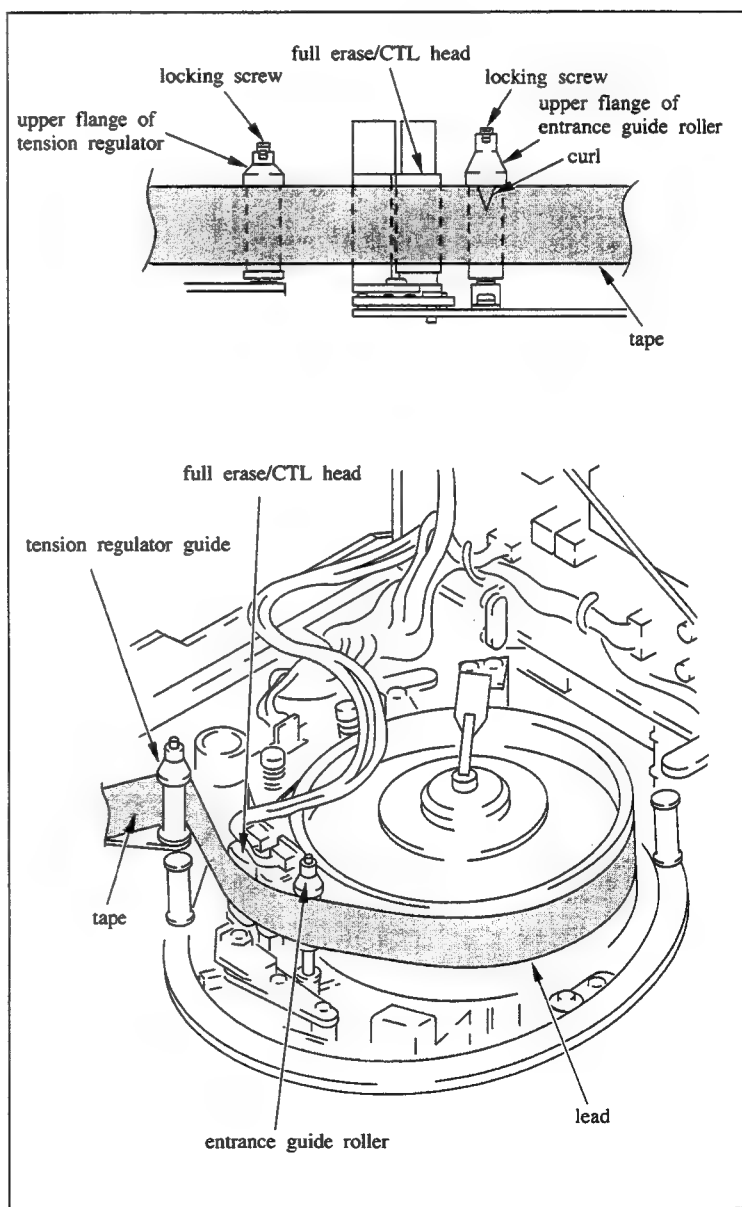
##### Specification 2:

No tape curl shall exist.

If the specifications 1 and 2 are not satisfied, perform step 5 and later.

If the specifications 1 and 2 are satisfied, perform step 9 and later.

5. Loosen the locking screws at each flange of the tension regulator roller and entrance guide roller for two to three turns.
6. Turn the upper flange of the tension regulator roller, so the tape runs along the lead of drum.
7. Turn the upper flange of entrance guide roller, so that the upper edge of the tape runs in contact with the upper flange without any curl.





8. Tighten the locking screw at each flange of the tension regulator roller and the entrance guide roller, but do not tighten.
9. Make sure using a adjustment mirror that the tape curl at each flange of the exit guide roller and the tape threading guide roller satisfy the specification 3.

**Specification 3:**

No tape curl shall exist at each tape guide.

10. Make sure that the tape curl at the drum exit side satisfies the specification 4.

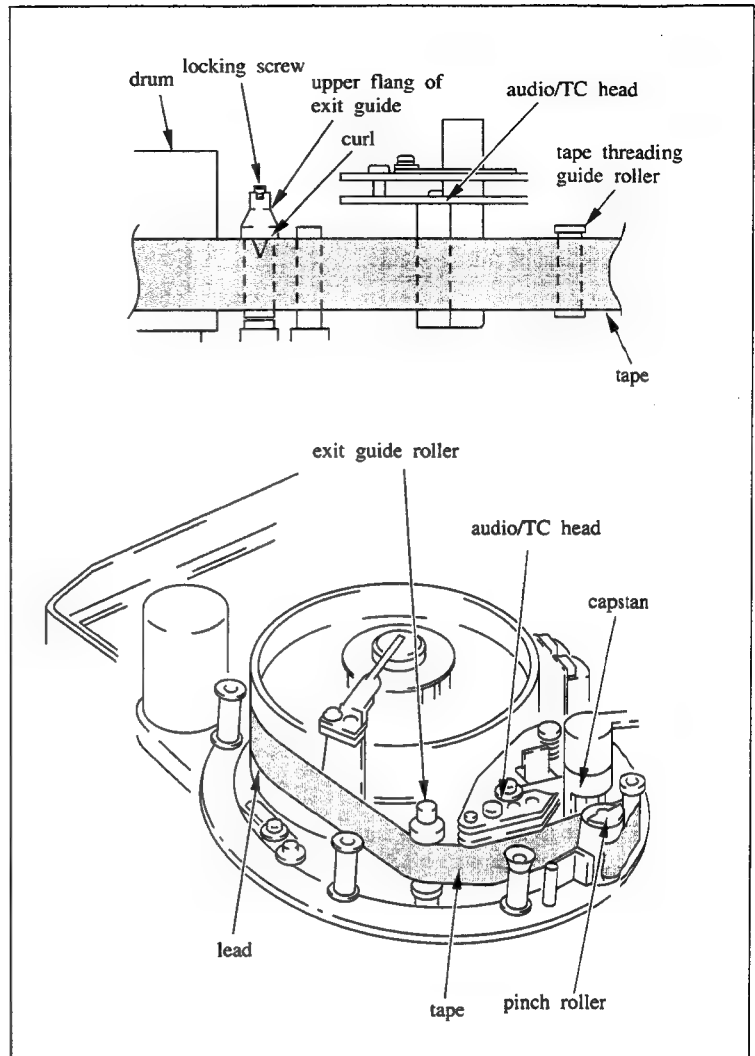
**Specification 4:**

No tape curl shall exist.

If the specifications 3 and 4 are not satisfied, perform step 11 and later.

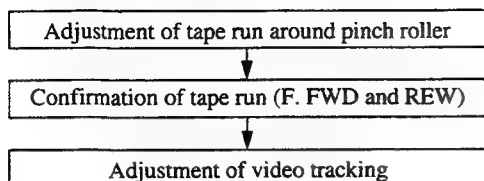
If the specifications 3 and 4 are satisfied, perform step 14 and later.

11. Loosen the locking screw at the upper flange of the exit guide roller for one to two turns using the tape guide adjustment driver.
12. Turn the upper flange of the exit guide roller, and adjust the tape to run along the lead of drum, and at the same time to run with its upper edge of tape in contact with the flange without any curling at the upper flange.
13. Tighten the locking screw at the upper flange of exit guide roller, but do not tighten.
14. Perform tape run adjustment around pinch roller. (Refer to Section 4-2-4.)
15. Perform tape run confirmation (F.FWD and REW). (Refer to Section 4-2-6.)
16. Perform video tracking adjustment. (Refer to Section 4-3.)



#### 4-2-4. Tape Run Adjustment around Pinch Roller

##### Adjustment flow chart



##### Tools

Cassette tape without lid (BCT-30M)

(Never use an alignment tape)

Adjustment mirror: J-6080-029-A

##### Adjustment

1. Insert a cassette tape without lid, and put the unit into PLAY mode.
2. Make sure that the specifications 1 and 2 are satisfied in the area A and B respectively shown in the figure.

##### Specification 1:

There shall be no uneven tape tension in the area between the audio/TC head and capstan shaft (area A shown in the figure).

##### Specification 2:

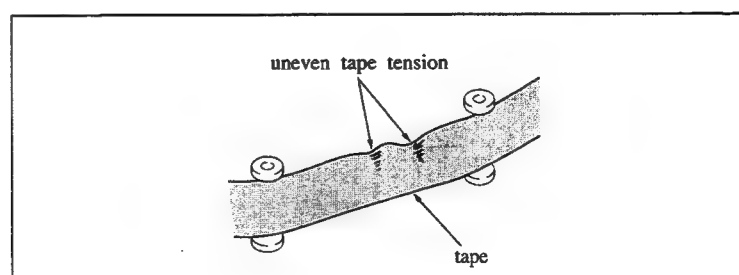
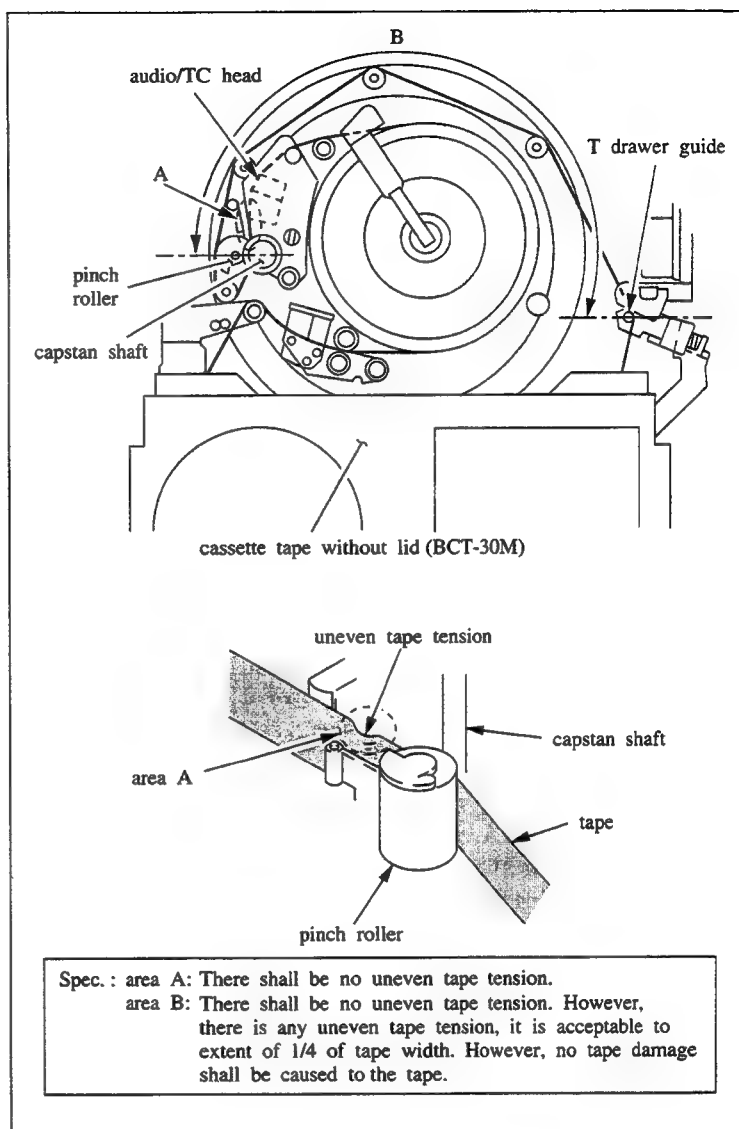
There shall be no uneven tape tension in the area between the pinch roller and T drawer guide (area B shown in the figure).

If, however, there is any uneven tape tension, it is acceptable to the extent of 1/4 of tape width.

However, no tape damage shall be caused to the tape by its uneven tape tension.

If both specifications 1 and 2 are satisfied, perform step 4 and later.

If either or both of the specifications 1 and 2 are not satisfied, perform step 3 and later.



3. Make sure that the audio head zenith adjustment satisfies the required specification. (Refer to Section 4-9.)

If the specification is not satisfied: Adjust the zenith of the audio head and make sure by repeating the above steps.

If the specification is satisfied: Perform fine zenith adjustment of the audio head and make sure by repeating the above steps.

However, pay full attention to the possible impact on the video tracking adjustment as well as in audio system electrical adjustment caused by audio head zenith adjustment.

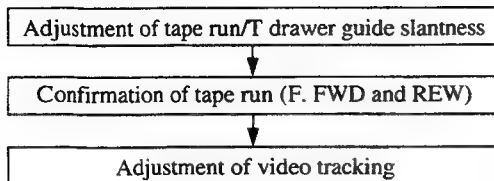
If both specifications 1 and 2 are satisfied: Perform step 4 and later.

If both specifications 1 and 2 are not satisfied: Make sure once again after replacement of the threading ring assembly and the relative adjustment.

4. Perform tape run confirmation ( F.FWD and REW). (Refer to Section 4-2-6.)
5. Perform video tracking adjustment. (Refer to Section 4-3.)

#### 4-2-5. Tape Run Adjustment/T Drawer Guide Slantness Adjustment.

##### Adjustment flow chart



##### Tools

Cassette tape without lid (tape beginning cassette)  
(BCT-30M)  
(Never use an alignment tape)  
Adjustment mirror: J-6080-029-A

##### Adjustment

1. Insert a cassette tape into the unit after winding for about one minute from the tape beginning, and put the unit into PLAY mode.
2. Pay attention to the tape guide at its take-up side of the cassette tape in 4 to 7 seconds after its start.
3. Make sure that the running tape stays in the right position shown in the figure of the tape guide. (Specification 1)  
Repeat steps 1 and 2 for four to five times and make sure that the specification 1 is satisfied.  
If the specification 1 is satisfied:  
Perform step 4 and later.  
If the specification 1 is not satisfied:  
Perform step 6, then perform step 4.
4. Put the unit into STOP mode once, then push the PLAY button again to put it into PLAY mode.
5. Make sure that the uneven tape tension in the area between the tape guide on the threading ring and T drawer guide (area A shown in the figure) is within the required specification. (Specification 2)

##### Specification 2:

It is most desirable to have no uneven tension of tape at all.

If, however, there is any uneven tape tension, it is acceptable to the extent of 1/4 of tape width.

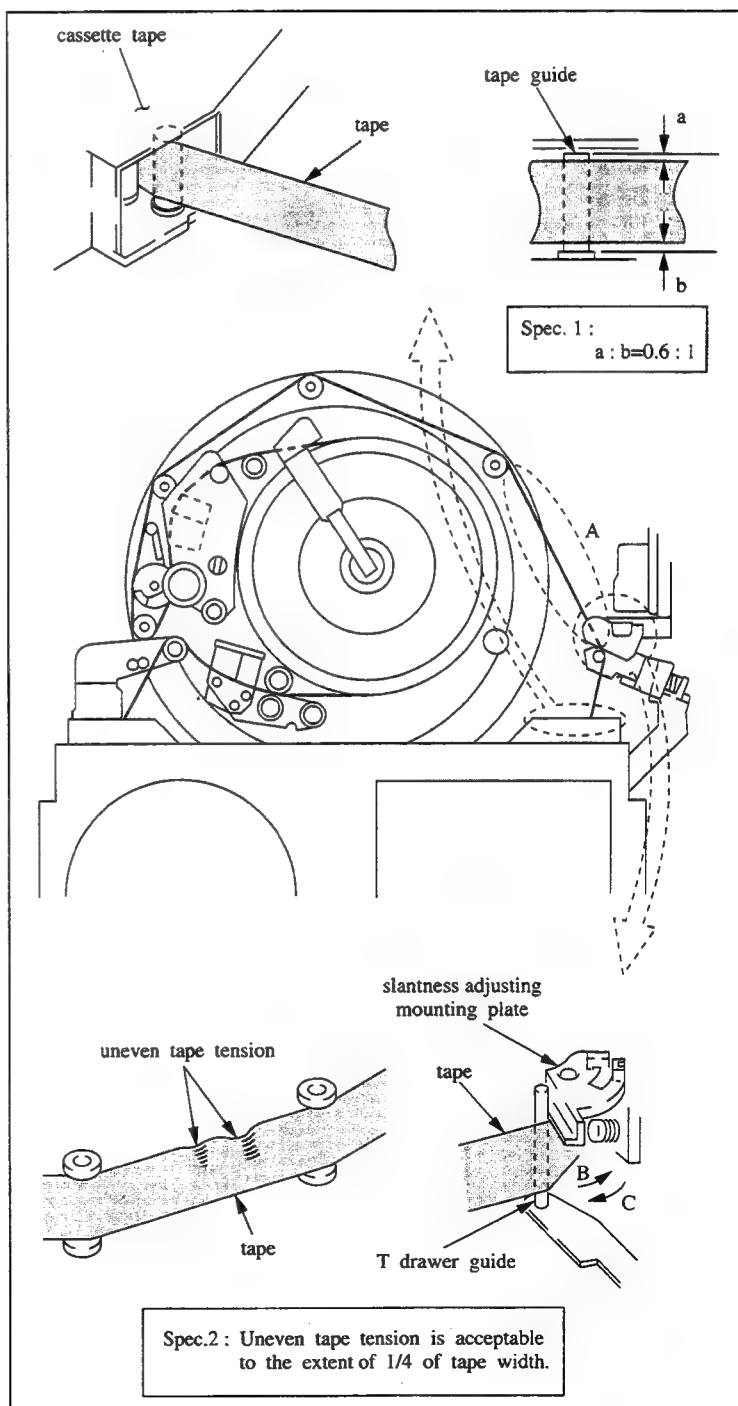
However, no tape damage shall be caused to the tape by its uneven tape tension.

By repeating steps 4 and 5 for four to five times, make sure that the required specification 2 is satisfied.

If the specification 2 is satisfied:

Perform step 7 and later.

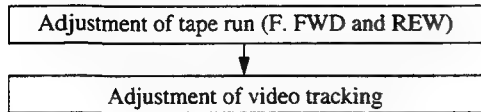
If the specification 2 is not satisfied: Perform step 6 and later.



6. After putting the unit into PLAY mode, move the slantness guide mounting plate with finger so as to obtain both specifications 1 and 2.  
In case that the tape runs the upper part of cassette tape guide, move the slantness guide mounting plate in the direction of arrow B.  
In case that the tape runs the lower part of cassette tape guide, move the slantness guide mounting plate in the direction of arrow C.
7. Perform tape run confirmation (F.FWD and REW). (Refer to Section 4-2-6.)
8. Perform video tracking adjustment. (Refer to Section 4-3.)

#### 4-2-6. TAPE RUN CONFIRMATION ( F.FWD and REW)

##### Adjustment flow chart



##### Tools

Cassette tape without lid (BCT-30M)

(Never use an alignment tape)

Adjustment mirror: J-6080-029-A

##### Adjustment

1. Insert a cassette tape (BCT-30M) without lid in the unit.
2. Press the F.FWD button, and put the unit into F. FWD mode.
3. Make sure using an adjustment mirror that the tape curl at the respective flange of tension regulator roller, entrance guide roller, drum lead and exit guide roller satisfy the specification 1. (Specification 1)

##### Specification 1:

It is most desirable to have no tape curl at all.

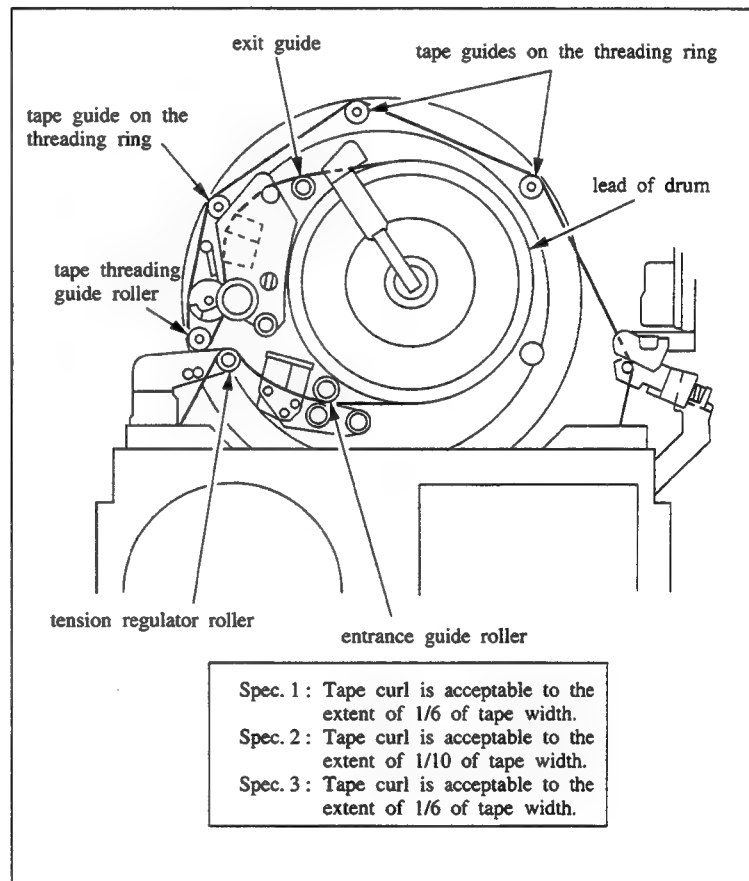
If, however, there is any tape curl, it is acceptable to the extent of 1/6 of tape width.

Make sure using an adjustment mirror that the tape curl at flange of tape threading guide rollers satisfies the specification 2. (Specification 2)

##### Specification 2:

It is most desirable to have no tape curl at all.

If, however, there is any tape curl, it is acceptable to the extent of 1/10 of the tape width.



4. Make sure that the tape curl at the respective flange of the tape guides on threading ring satisfy the specification 3. (Specifications 3)

**Specification 3:**

It is most desirable to have no tape curl at all.

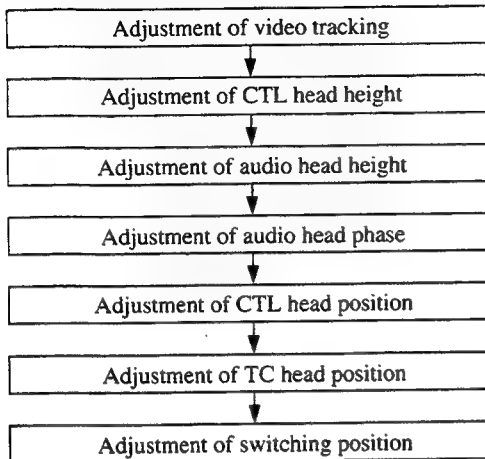
If, however, there is any tape curl, it is acceptable to the extent of 1/6 of the tape width.

If the specifications 1 to 3 are not satisfied, perform step 7 and later.

5. Press the REW button, put the unit into REW mode.
6. Make sure, as in steps 3 and 4, that the tape curl at the tape guide flange and drum lead satisfy the specifications 1 to 3.  
If the specifications 1 to 3 are not satisfied, perform step 7 and later.
7. Make sure once again after the replacement of threading ring assembly and the relative adjustment.
8. Perform video tracking adjustment.  
(Refer to Section 4-3.)

### 4-3. VIDEO TRACKING ADJUSTMENT

#### Adjustment flow chart



#### Tools

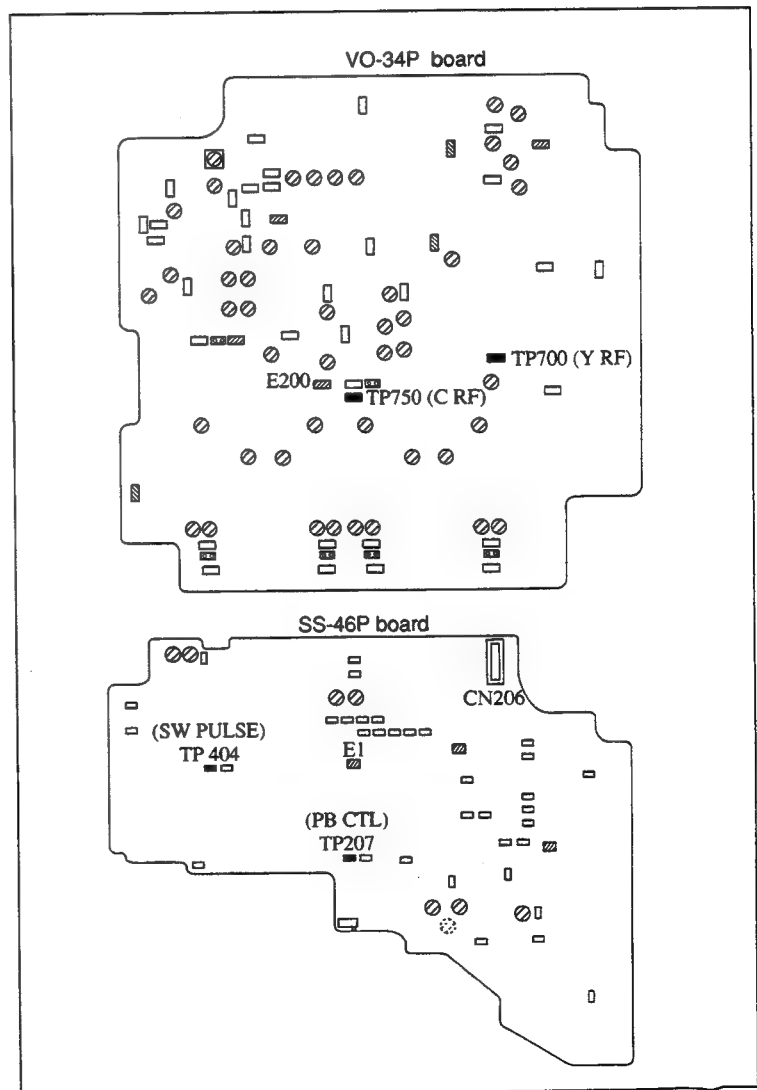
Cleaning piece:	2-034-697-00
Cleaning fluid:	9-919-573-01
Alignment tape without lid CR2-1B PS:	8-960-096-51
Adjustment mirror:	J-6080-029-A
Servo remote control tool (EW-229):	J-6332-290-A
Cable (EW-804):	J-6338-040-A
Tape guide adjustment driver:	J-6321-500-A
Dual trace oscilloscope	

#### Setting

1. Connect the 14 pin connector of cable (EW-804) with the tool.
2. Connect the connector at harness end with CN206 on SS-46P board of the unit.
3. Clean the outer circumference of drum and tape guides with a cleaning piece moistened with cleaning fluid.

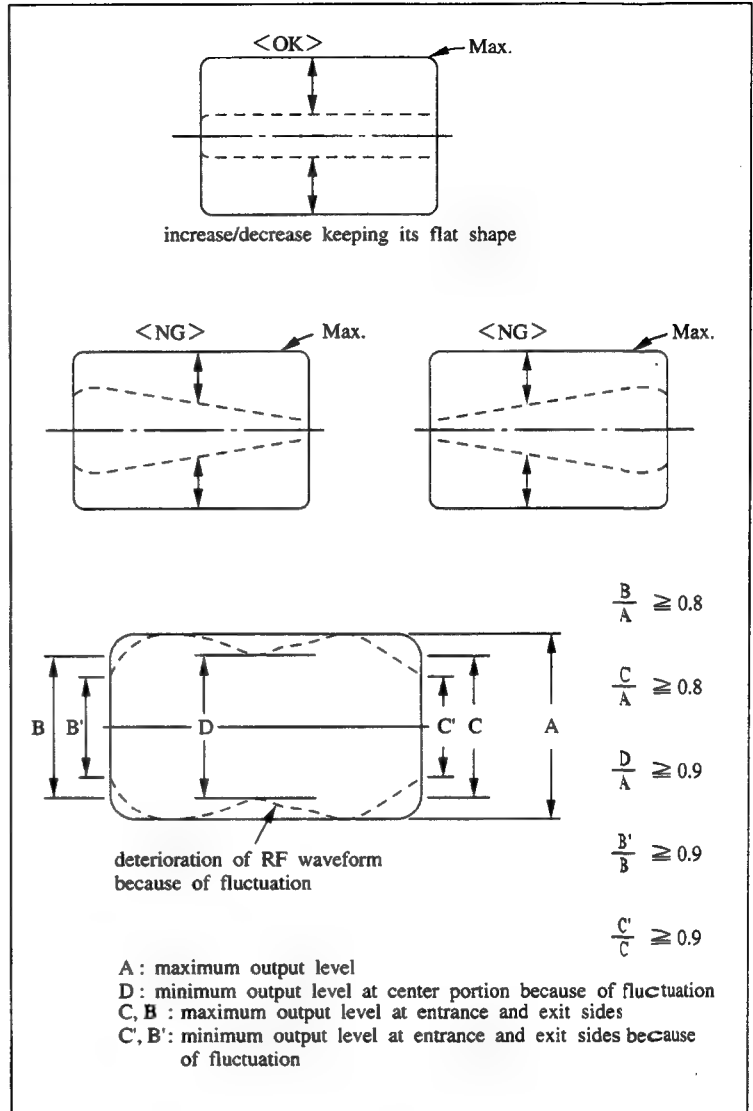
#### Check

1. Connect the oscilloscope as follows.  
 CH-1: TP700/VO-34P board  
 (Address: Surface A, E-3) (Y-RF signal)  
 CH-2: TP404/SS-46P board  
 (Address: Surface A, A-2) (Switching pulse)  
 TRIG: CH-2



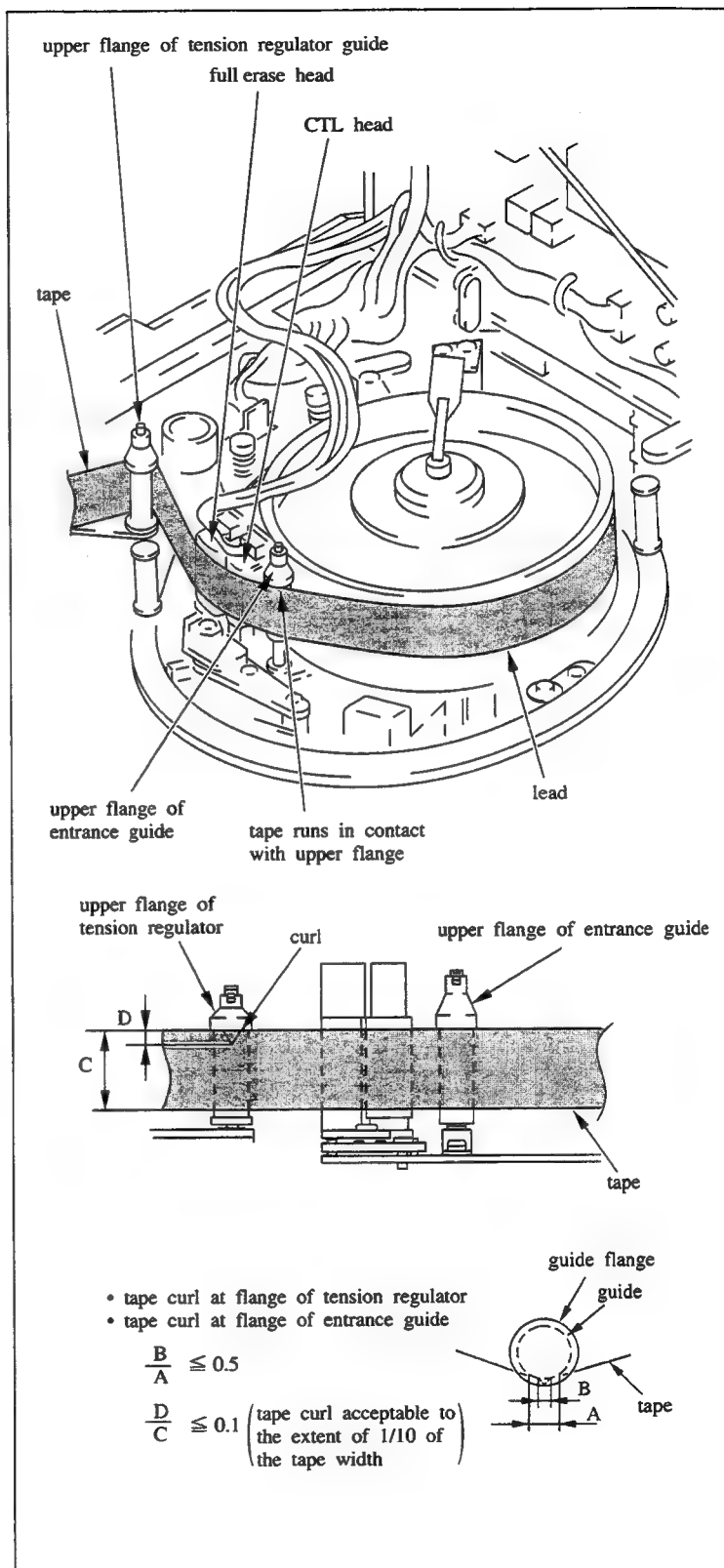


2. Insert an alignment tape CR2-1B PS, and put the unit into PLAY mode.
3. After putting the servo remote control tool in TRCON mode, make sure that the RF envelope waveform increases/decreases keeping its flat shape when (+) or (-) button of tracking control is pressed down.
4. Make sure that the head-to-tape contact waveform and fluctuation of waveform satisfy the required specifications when the RF envelope waveform is maximized.

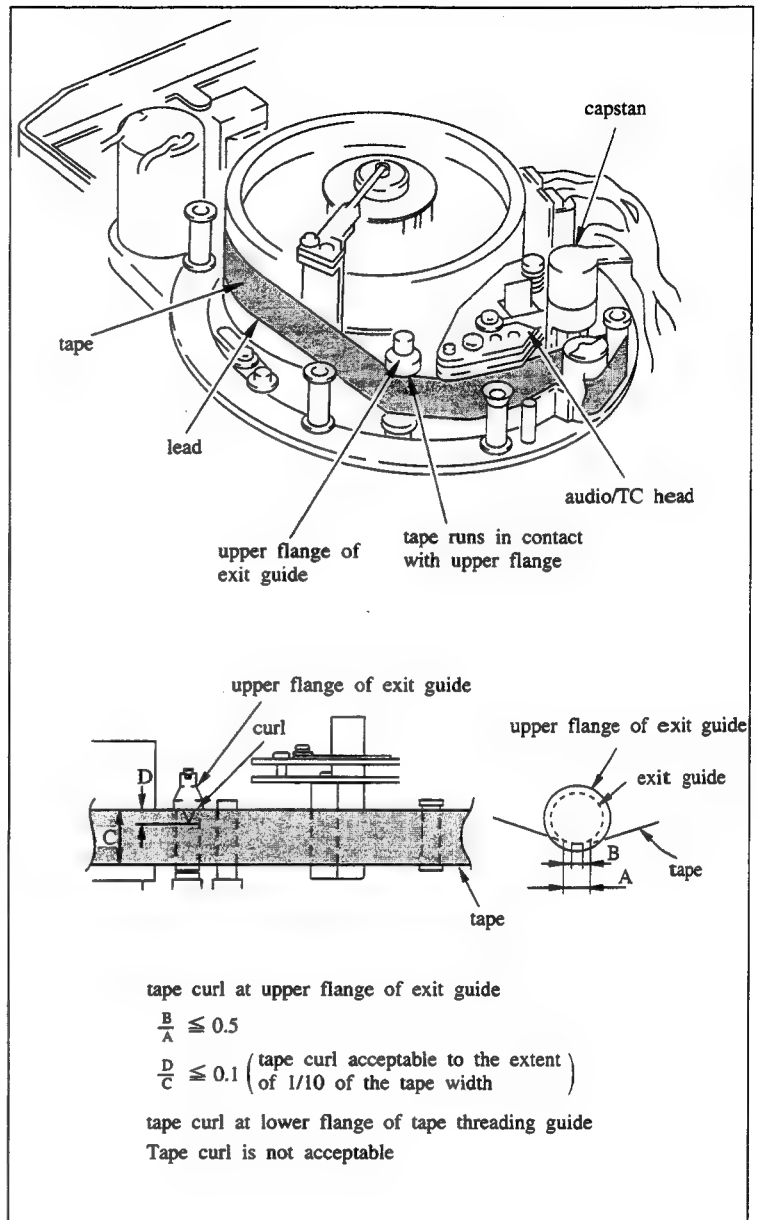


## Adjustment

- For the adjustment of tracking at drum entrance side, perform steps 5 through 8 and step 13 and later.
  - For the adjustment of tracking at drum exit side, perform step 9 and later.
5. Pressing (+) or (-) button of tracking control, maintain the RF envelope waveform at 70 to 80% of the maximum output.
  6. Loosen the locking screws of respective flange at the tension regulator roller and entrance guide roller for two to three turns with the tape guide adjustment driver.
  7. Rotating the upper flanges of the tension regulator roller and entrance guide, adjust the height of the upper flanges to satisfy the following specifications. (Confirm the tape curl using the adjustment mirror.)
    - (1) Put the RF envelope waveform at the entrance side in flat shape.
    - (2) Tape runs in contact with the lead at the drum entrance side without tape.
    - (3) No tape curl to occur at the upper flange. (If tape curl can not be removed, it is acceptable as far as the maximum limit shown in the figure.)



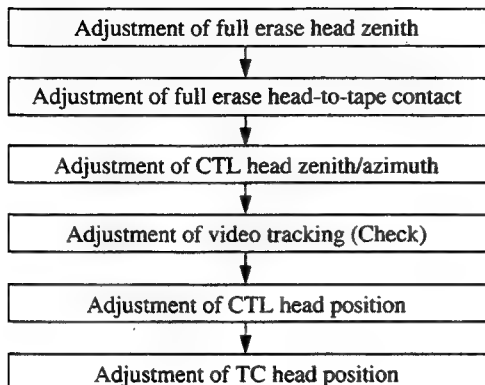
8. Tighten the locking screws at the respective flange of tension regulator roller and entrance guide roller.
9. Pressing (+) or (-) button of tracking control, maintain the RF envelope waveform at 70 to 80% of the maximum output.
10. Loosen the locking screw at upper flange of the exit guide roller for one to two turns using the tape guide adjustment driver.
11. Rotate the upper flange of the exit guide roller, and adjust its height to satisfy the following specifications. (Confirm the tape curl using the adjustment mirror.)
  - (1) Put the RF envelope waveform at the exit side in flat shape.
  - (2) Tape runs in contact with the lead at the drum exit side.
  - (3) No tape curl to occur at the upper flange. (If tape curl can not be removed, it is acceptable as far as the maximum limit shown in the figure.)
12. Tighten the locking screw at the upper flange of the exit guide roller.
13. Pressing (+) or (-) button of tracking control, maximize the output at the center of RF envelope waveform.
14. Make sure that the head-to-tape contacting waveform and its fluctuation satisfy the required specifications when the RF envelope waveform is maximized.
15. Make sure that the required specifications are satisfied without changing the waveform when standing the unit keeping the connector box down.
16. Connect the oscilloscope with TP750/VO-34P board (Address: Surface A, C-4)
17. Make sure that the RF envelope waveform increases/decreases keeping its flat shape when pressing (+) or (-) button of tracking control after servo remote control tool has been put into TRCON mode.



18. Make sure that the head-to-tape contacting waveform and its fluctuation satisfy the required specifications when the RF envelope waveform is maximized.
19. Make sure using the adjustment mirror that the lower edge of the tape runs in contact with the lower flange of the tape threading guide roller without any tape curl.  
If not to satisfy the specification, turn the flange of the tape threading guide roller to satisfy the specification.
20. Perform CTL head height adjustment. (Refer to Section 4-7.)
21. Perform audio head height adjustment. (Refer to Section 4-10.)
22. Perform audio head phase adjustment. (Refer to Section 4-11.)
23. Perform CTL head position adjustment. (Refer to Section 4-8.)
24. Perform TC head position adjustment. (Refer to Section 4-12.)
25. Perform switching position adjustment. (Refer to Section 4-14.)

#### 4-4. FULL ERASE HEAD ZENITH ADJUSTMENT

##### Adjustment flow chart



##### Tools

Cleaning piece: 2-034-697-00

Cleaning fluid: 9-919-573-01

Cassette reference plate: J-6080-008-A

Tension regulator slantness check tool:  
J-6190-800-A

##### Adjustment

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Clean both surfaces of cassette reference plate with a cleaning piece moistened with cleaning fluid.
3. Clean the surface of tension regulator slantness check tool in the same manner.
4. Place the cassette reference plate on four cassette pillars.
5. Place the tension regulator slantness check tool on the cassette reference plate, and contact the slantness check tool softly with the tape contacting surface of the full erase head.

**Note:** Pay particular attention not to scratch the tape contacting surface of the full erase head.

6. Make sure visually that the zenith at full erase head satisfies the required specifications.

##### Specification 1:

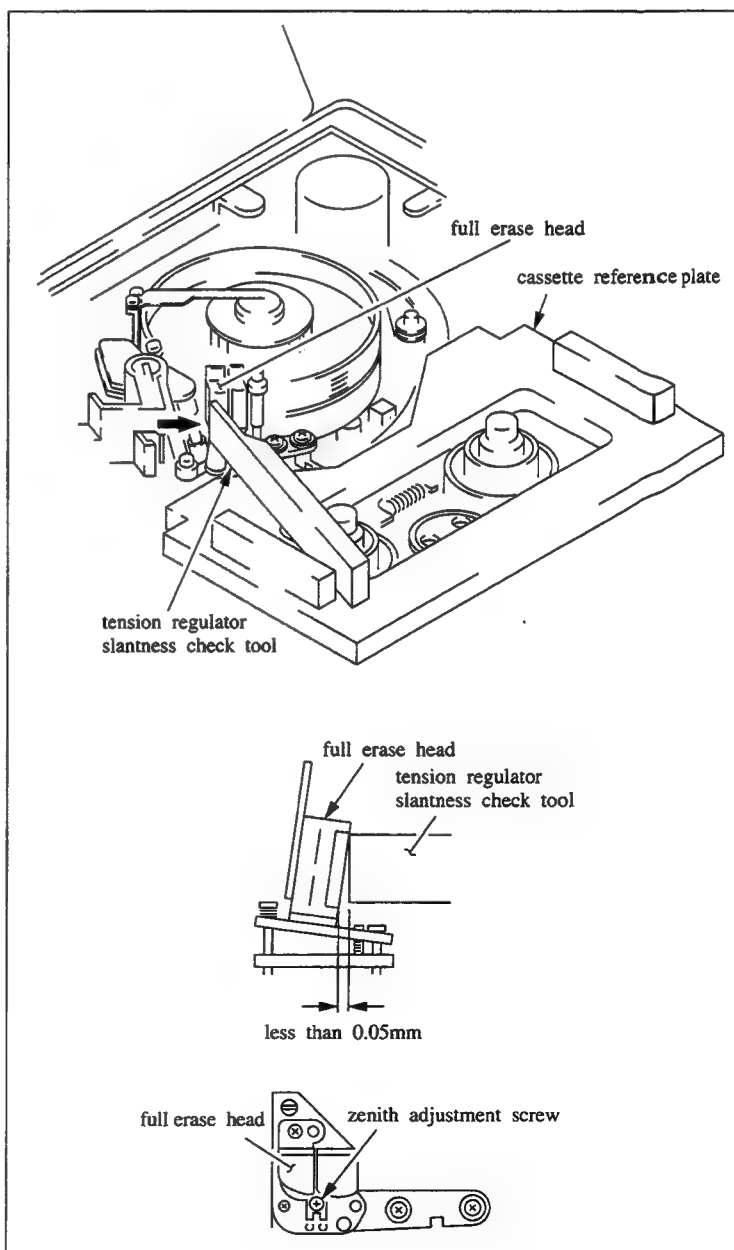
Be sure that the upper part of the head is in contact with the slantness check tool.

##### Specification 2:

The clearance between lower part of the head and the slantness check tool must be virtually nil or extremely narrow. (Clearance to be 0.05 mm max.)

If the specifications are satisfied, perform step 8 and later.

If the specifications are not satisfied, perform step 7 and later.



7. Turning zenith adjustment screw, adjust it to satisfy the required specifications.

In case of clearance occurs at lower part, adjust it by turning the zenith adjustment screw in counterclockwise direction.

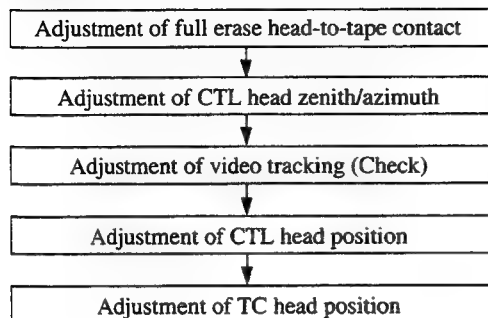
With 1/4 turn, the clearance at lower part of head will decrease about 0.1 mm.

In case of clearance occurs at upper part, adjust it by turning the zenith adjustment screw in clockwise direction.

8. Perform full erase head-to-tape contact adjustment. (Refer to Section 4-5.)
9. Perform CTL head zenith/azimuth adjustment. (Refer to Section 4-6.)
10. Confirm video tracking at the drum entrance side. (Refer to Section 4-3.)
11. Perform CTL head position adjustment. (Refer to Section 4-8.)
12. Perform TC head position adjustment. (Refer to Section 4-12.)

## 4-5. FULL ERASE HEAD-TO-TAPE CONTACT ADJUSTMENT

### Adjustment flow chart

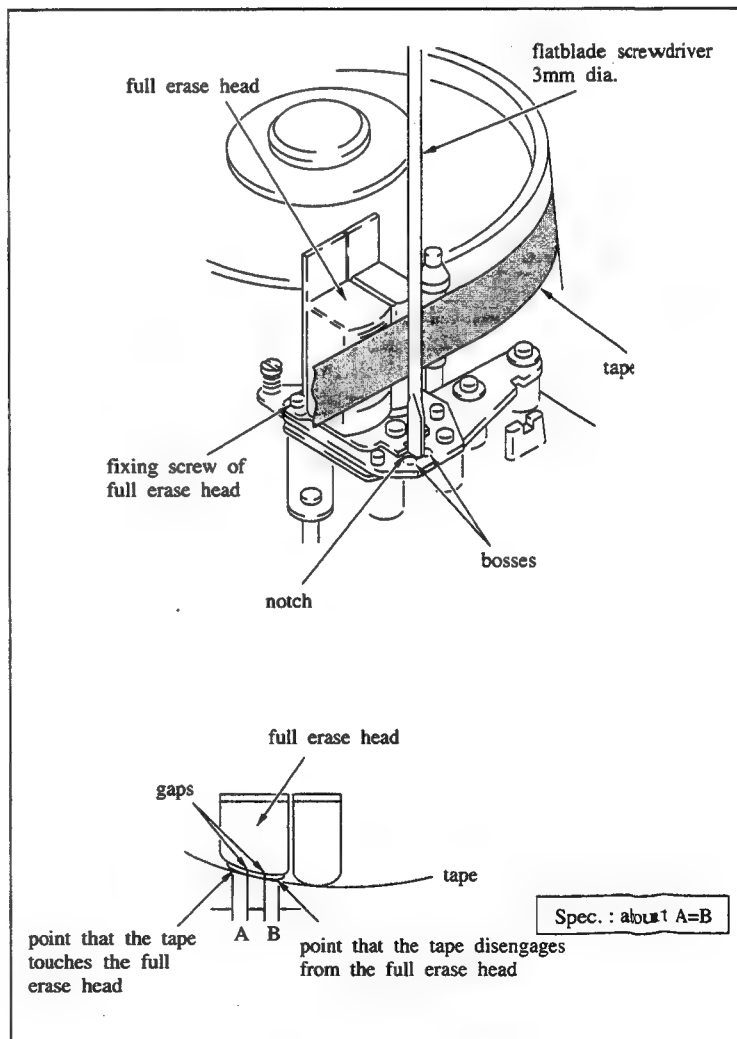


### Tool

Cassette tape without lid (BCT-30M)

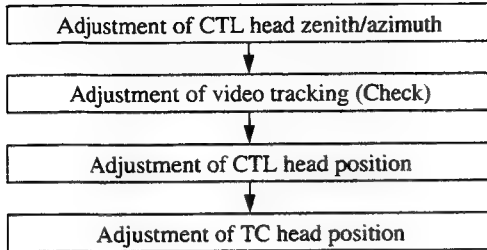
### Adjustment

1. Insert a cassette without lid in the unit and put it into PLAY mode.
2. Make sure that the positions of A and B where the tape and head are in contact with, satisfy the required specification by looking down the full erase head from just above it.  
If the specification is satisfied, perform step 8 and later.  
If the specification is not satisfied, perform step 3 and later.
3. After putting the unit into EJECT mode, and the rotation of drum stopped completely, loosen the fixing screw of the full erase head for about 1/3 to 1/2 turn.  
**Note:** Be careful not to scratch the drum with driver when the screw is loosened.
4. After putting the unit in PLAY mode once again, adjust it to satisfy the required specification upon placing the 3 mm dia. flatblade screwdriver at the position indicated in the figure.
5. After the adjustment, put the unit into EJECT mode.
6. After the drum rotation comes to complete stop, tighten the fixing screw of the full erase head.
7. Put into PLAY mode once again, and make sure that the specifications are satisfied.
8. Perform CTL head zenith/azimuth adjustment. (Refer to Section 4-6.)
9. Perform video tracking (Check). (Refer to Section 4-3.)
10. Perform CTL head position adjustment. (Refer to Section 4-8.)
11. Perform TC head position adjustment. (refer to Section 4-12.)



## 4-6 CTL HEAD ZENITH/AZIMUTH ADJUSTMENT

### Adjustment flow chart



### Tools

Cleaning piece: 2-034-697-00  
Cleaning fluid: 9-919-573-01  
Cassette reference plate: J-6080-008-A  
Tension regulator slantness check tool : J-6190-800-A

### Adjustment

1. Make sure that the unit is in unthreading end mode. (Refer to Section 3-1.)
2. Clean both surfaces of a cassette reference plate with a cleaning piece moistened with cleaning fluid.
3. Clean the surface of tension regulator slantness check tool in the same manner.
4. Place the cassette reference plate on four cassette pillars.
5. Place the tension regulator slantness check tool on the cassette reference plate, and contact the slantness check tool softly with the tape contacting surface and the side of the CTL head.

**Note:** Pay particular attention not to scratch the tape contacting surface of the CTL head.

6. Contacting the slantness check tool with the tape contacting surface of the CTL head, make sure visually that the zenith satisfies the required specifications.

### Specification 1:

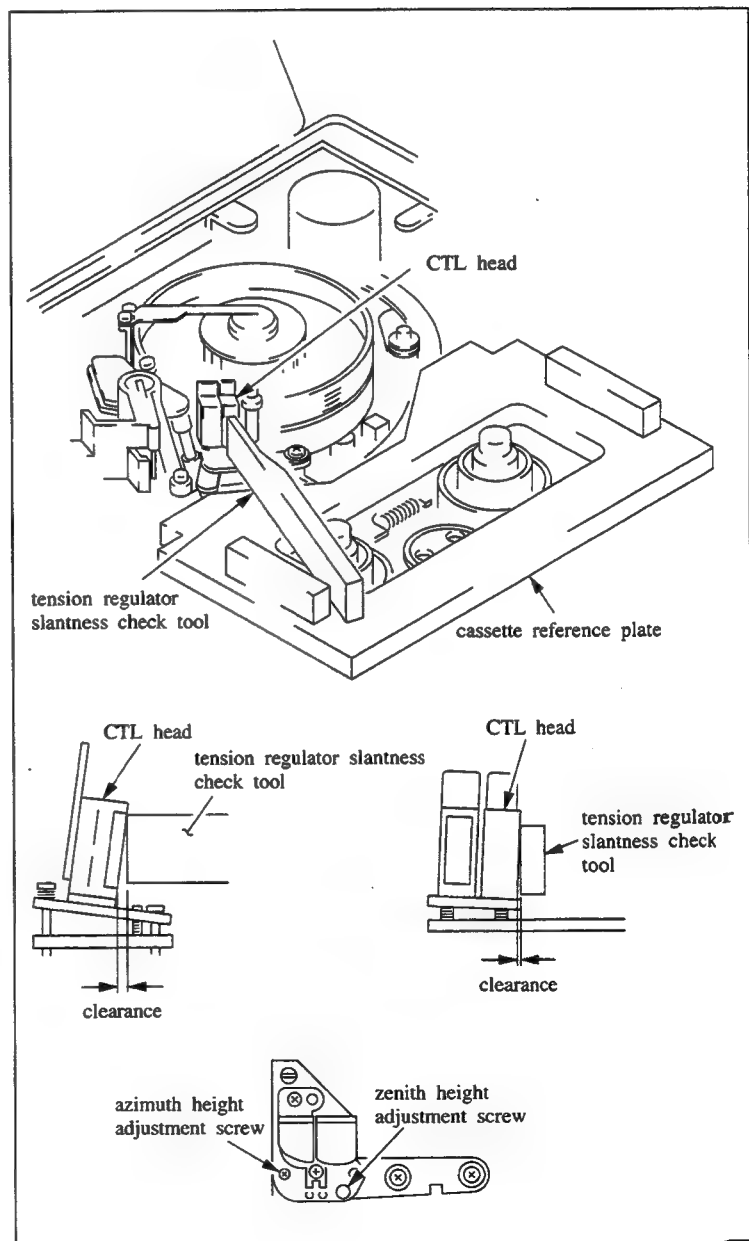
Be sure that the upper part of the head is in contact with the slantness check tool.

### Specification 2:

Clearance between the head and the slantness check tool must be virtually nil. (Acceptable clearance is 0.05 mm max.)

If the specifications are satisfied, perform step 8 and later.

If the specifications are not satisfied, perform step 7 and later.





7. Turning the zenith height adjustment screw, adjust it to satisfy the required specifications.  
In case of clearance occurs at the lower part, adjust it by turning the zenith height adjustment screw in counterclockwise direction.  
In case of clearance occurs at the upper part, adjust it by turning the zenith height adjustment screw in clockwise direction.
8. Contacting the slantness check tool with the side surface of the CTL head, and make sure visually that its azimuth satisfies the required specification.

**Specification 3:**

Clearance between the head and the slantness check tool must be virtually nil.  
(Acceptable clearance is 0.1 mm max.)

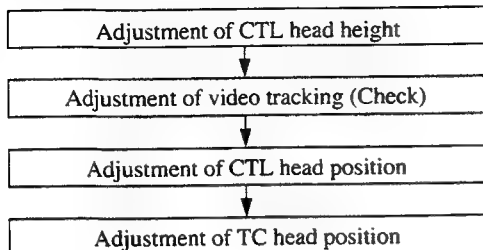
If the specification is satisfied, perform step 10 and later.

If the specification is not satisfied, perform step 9 and later.

9. Turning the azimuth height adjustment screw, adjust it to satisfy the required specification.  
In case of clearance occurs at lower part, adjust it by turning the azimuth height adjustment screw in counterclockwise direction.  
In case of clearance occurs at upper part, adjust it by turning the azimuth height adjustment screw in clockwise direction.
10. Make sure that the zenith is within the required specification in accordance with step 6.
11. Confirm video tracking at the drum entrance side. (Refer to Section 4-3.)
12. Perform CTL head position adjustment. (Refer to Section 4-8.)
13. Perform TC head position adjustment. (Refer to Section 4-12.)

## 4-7. CTL HEAD HEIGHT ADJUSTMENT

### Adjustment of flow chart



### Tools

Alignment tape without lid CR8-1A PS:

8-960-098-45

Oscilloscope

### Adjustment

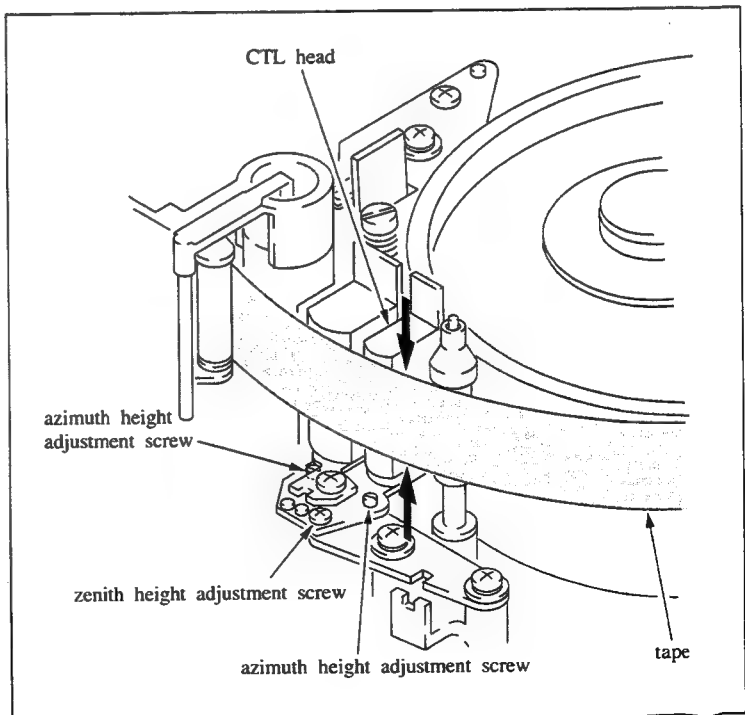
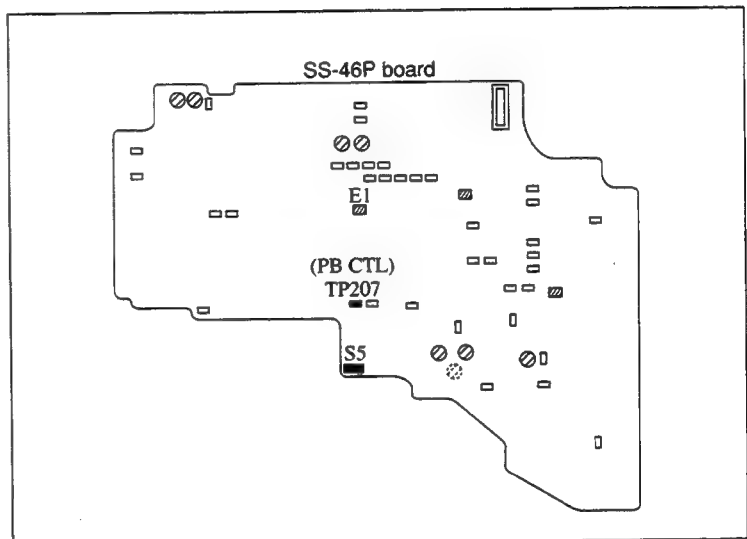
1. Put the switch S5 on SS-46P board in "SLACK MUTE ON" state.
2. Connect the oscilloscope as follows:  
CH-1: TP207/SS-46P board  
(Address: Surface A, C-4) (PB CTL signal)
3. Insert an alignment tape CR8-1A PS, then play back the portion where 1 kHz signal has been recorded on CTL track.
4. Make sure that the level goes down when the part of the tape shown in the figure is pressed down and pushed up slightly.  
If the level goes up, perform step 5 and later.  
If the level goes down in both cases, perform step 8 and later.
5. In case that the level goes up when the tape is pressed down:  
(1) Adjust the waveform to maximum by turning the azimuth height adjustment screw in clockwise direction, and zenith height adjustment screw in counterclockwise direction to the exactly equal amount.  
In case that the level goes up when the tape is pushed up:  
(1) Adjust the waveform to maximum by turning the azimuth height adjustment screw in counterclockwise direction, and zenith height adjustment screw in clockwise direction to the exactly equal amount.
6. Perform step 4 once again, and make sure that the level goes down in both cases. In case the level goes up, make sure that the level of the change satisfies the required specification.

### Specification:

Level must go down.

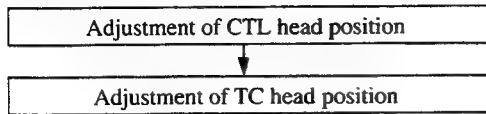
In case the level goes up, increasing level shall be 10% or less.

7. After adjustment, put back the switch S5 on SS-46P board to "SLACK MUTE OFF" state.
8. Make sure of the video tracking at the drum entrance side. (Refer to Section 4-3.)
9. Perform CTL head position adjustment. (Refer to Section 4-8.)
10. Perform TC head position adjustment. (Refer to Section 4-12.)



## 4-8. CTL HEAD POSITION ADJUSTMENT

### Adjustment flow chart

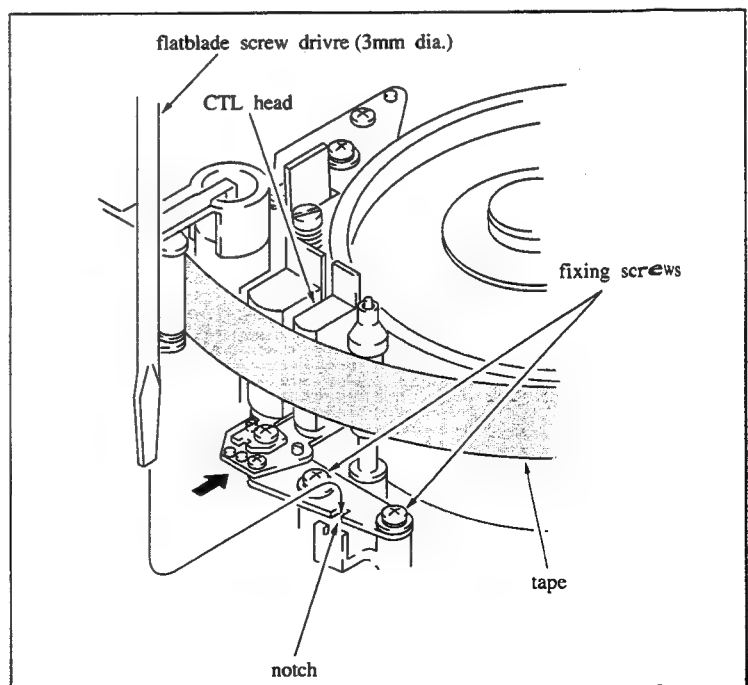
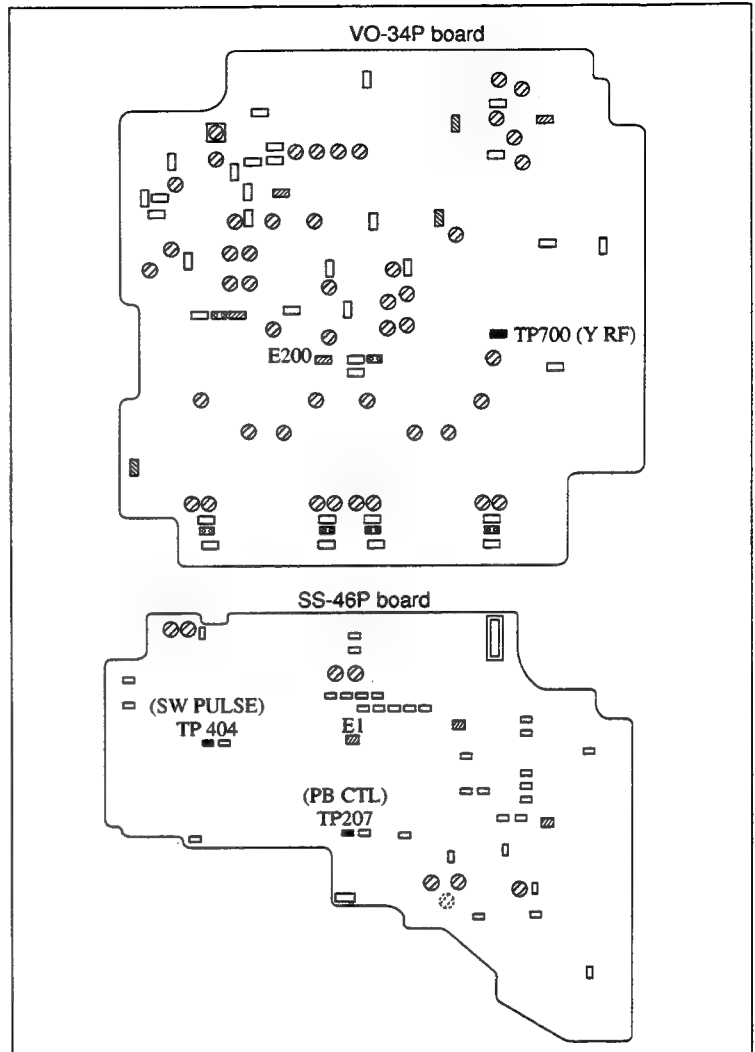


### Tools

Alignment tape without lid CR2-1B PS: 8-960-096-51  
 Servo remote control tool (EW-229): J-6332-290-A  
 Cable (EW-804): J-6338-040-A  
 Dual trace oscilloscope

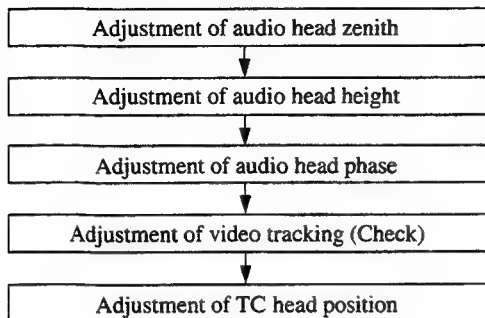
### Adjustment

1. Connect the oscilloscope as follows:  
 CH-1: TP700/VO-34P board  
 (Address: Surface A,E-3) (Y-RF signal)  
 CH-2: TP207/SS-46P board  
 (Address: Surface A,C-4) (PB CTL)  
 TRIG: TP404/SS-46P board  
 (Address: Surface A,A-2) (Switching pulse)  
 Memorandum this level.
2. Insert an alignment tape CR2-1B PS, and put the unit into PLAY mode.
3. After putting the servo remote control tool in TRCON mode, maximize the RF envelope waveform by pressing (+) or (-) button of tracking control.
4. Put off TRCON switch of servo remote control tool. Make sure that the level is same with the one in step 3.  
 In case level is same, perform step 7 and later.  
 In case level is different, perform step 5 and later.
5. Loosen two screws of a CTL head bracket by 1/2 to 1/4 turn.
6. Insert a 3 mm dia. flatblade screwdriver in the notch of the CTLL head bracket, and adjust the position of the CTL head while pushing it toward the drum so that the center level of the RF envelope waveform is maximized.
7. Tighten two fixing screws of the CTL head bracket while pushing it toward the drum.
8. Perform steps 3 and 4 once again, and make sure that the specification is satisfied.
9. Perform TC head position adjustment. (Refer to Section 4-12.)



## 4-9. AUDIO HEAD ZENITH ADJUSTMENT

### Adjustment flow chart



### Tool

Flatness plate: J-6086-570-A

### Adjustment

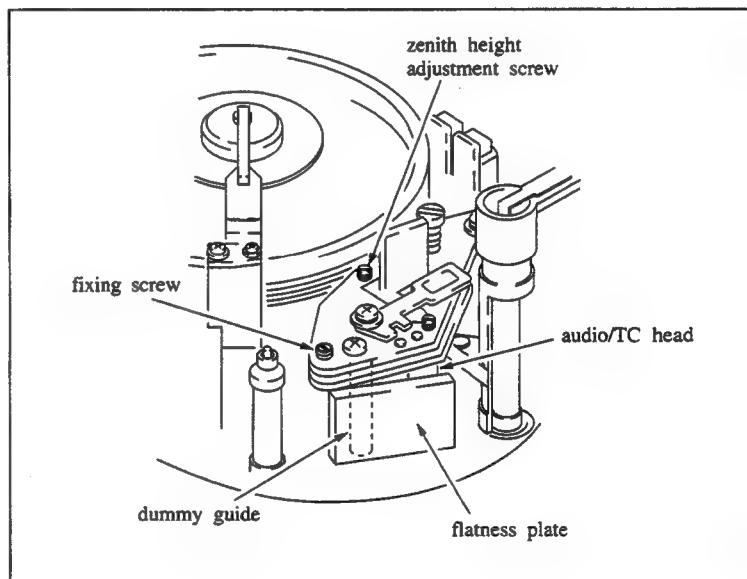
1. Make sure that the unit is in unthreading end state. (Refer to Section 3-1.)
2. Rotate the manual gear, so that the tape guide on the threading ring does not come to the position in front of the audio head.
3. Press a flatness plate against the audio head softly after contacting it with the dummy guide.  
**Note:** Pay particular attention not to scratch the tape contacting surface of the audio head.
4. While pressing the flatness plate against the dummy guide with finger, push the upper part of the flatness plate in front of the audio head softly with finger of the other hand. Then, push the lower part of the flatness plate in front of the audio head softly with finger of the other hand.

### Specification:

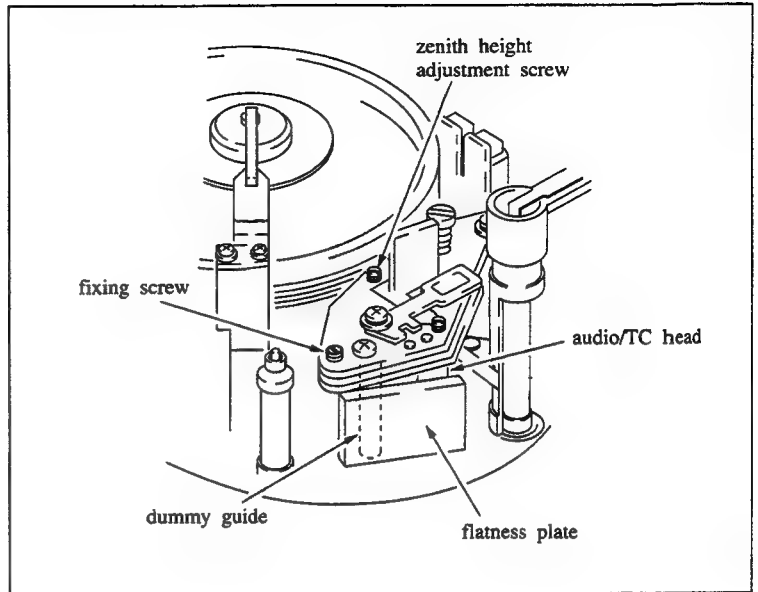
The flatness plate must not move when pushed the upper and lower parts.  
(In other words, no clearance shall exist between the flatness plate and head.)

If the specification is satisfied, perform step 9 and later.

If the specification is not satisfied, perform step 5 and later.

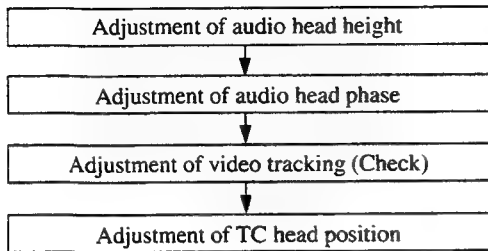


5. Loosen a fixing screw by 1/4 to one turn.
6. In case clearance is observed at lower part.  
Turn the zenith height adjustment screw in clockwise direction to meet the required specification.  
In case clearance is observed at upper part.  
Turn the zenith height adjustment screw in the counterclockwise direction to meet the required specification.
7. Tighten a fixing screw.
8. Make sure once again that the specification is satisfied.
9. Perform audio head height adjustment. (Refer to Section 4-10.)
10. Perform audio head phase adjustment. (Refer to Section 4-11.)
11. Perform confirmation of video tracking at the drum exit side. (Refer to Section 4-3.)
12. Perform TC head position adjustment. (Refer to Section 4-12.)



## 4-10. AUDIO HEAD HEIGHT ADJUSTMENT

### Adjustment flow chart



### Tools

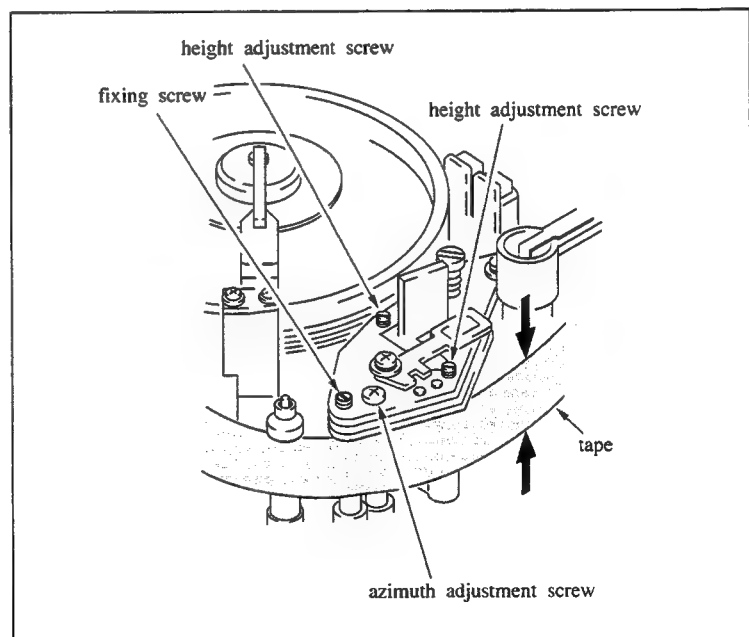
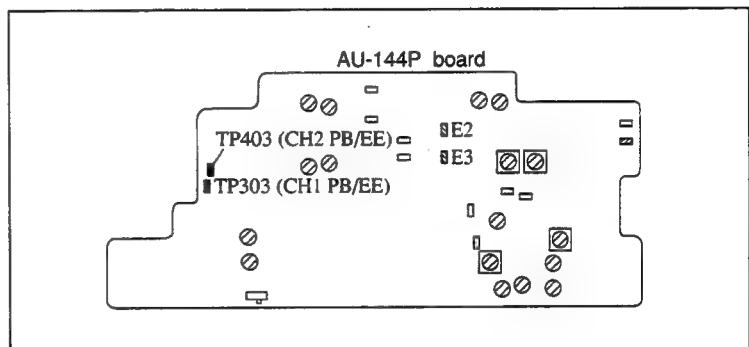
Alignment tape without lid CR8-1A PS:

8-960-098-45

Dual trace oscilloscope or audio level meter

### Adjustment

1. Put the switch S5 on SS-46P board in "SLACK MUTE ON" state.
2. Connect the oscilloscope or audio level meter as follows.  
CH-1: TP303/AU-144P board (CH-1)  
(Address: Surface A, B-1)  
CH-2: TP403/AU-144P board (CH-2)  
(Address: Surface A, B-1)
3. Insert an alignment tape CR8-1A PS, and play back the audio 1 kHz signal recorded portion in its last part of the alignment tape.
4. Make sure that the level goes down when the part of the tape shown in the figure is pressed down and pushed up slightly.  
If the level goes up, perform step 5 and later.  
If the level goes down in both cases, perform step 7 and later.
5. In case the level goes up when the tape is pressed down.
  - (1) Loosen a fixing screw by 1/2 to one turn.
  - (2) Adjust the waveform to maximum by turning the azimuth adjustment screw in clockwise direction, and height adjustment screw in counterclockwise direction to the exactly equal amount.
  - (3) Tighten a fixing screw.In case the level goes up when the tape is pushed up.
  - (1) Adjust the waveform to maximum by turning the azimuth adjustment screw in counterclockwise direction, and height adjustment screws in the clockwise direction to the exactly equal amount.
  - (2) Tighten a fixing screw.



6. Perform step 4 once again, and confirm that the level goes down in both cases. In case the level goes up, make sure that the level of the change satisfies the required specification.

**Specification:**

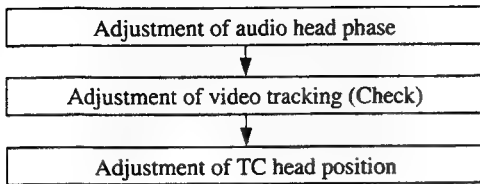
Level must shall go down.

If the level goes up: increasing level shall be 5% or less.

7. Put back the switch S5 on SS-46P board to "SLACK MUTE OFF" state.
8. Perform audio head phase adjustment. (Refer to Section 4-11.)
9. Perform confirmation of video tracking at the drum exit side. (Refer to Section 4-3.)
10. Perform CTL head position adjustment. (Refer to Section 4-8.)
11. Perform TC head position adjustment. (Refer to Section 4-12.)

## 4-11. AUDIO HEAD PHASE ADJUSTMENT

### Adjustment flow chart



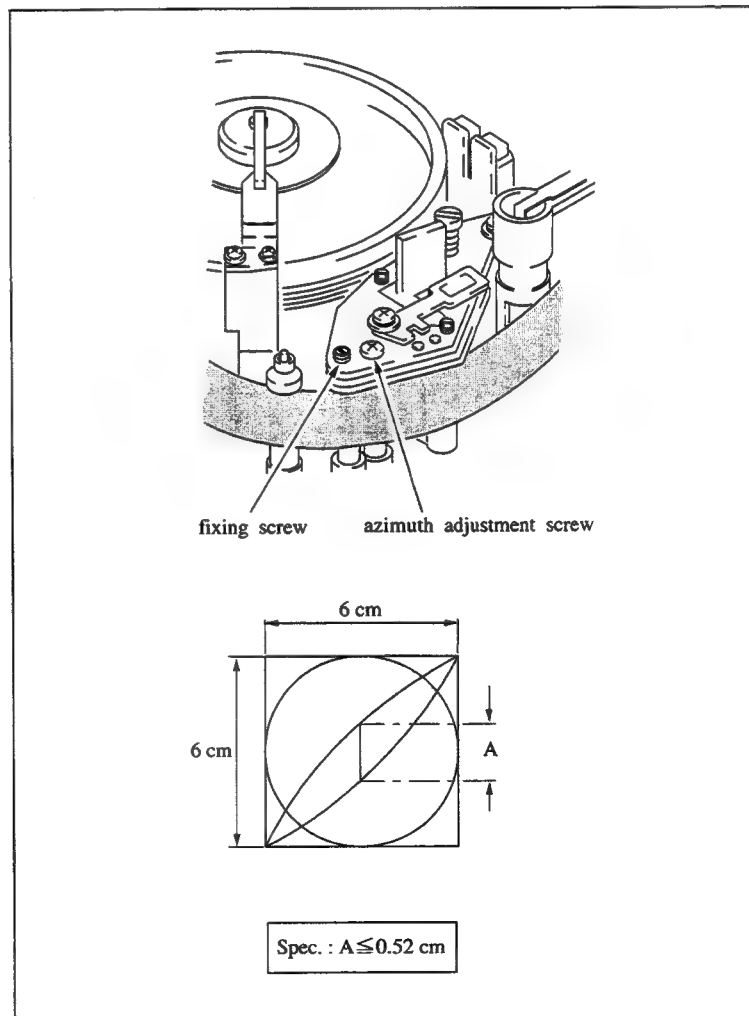
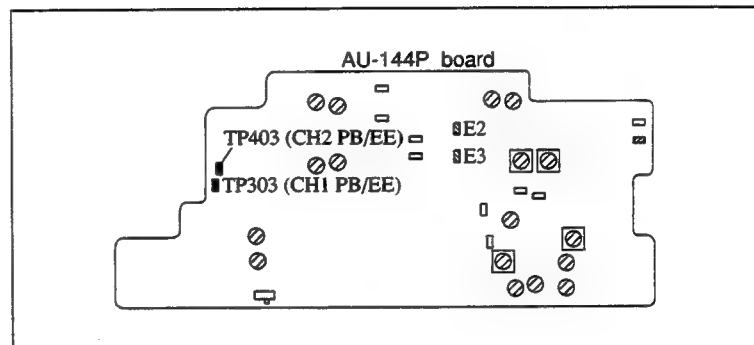
### Tools

Alignment tape without lid CR8-1A PS:  
8-960-098-45

Dual trace oscilloscope

### Adjustment

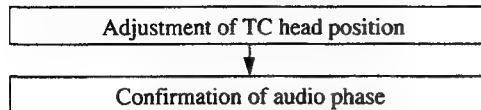
1. Put the switch S5 on SS-46P board in "SLACK MUTE ON" state.
2. Connect the oscilloscope as follows:  
CH-1: TP303/AU-144P board (CH-1)  
(Address: Surface A, B-1)  
CH-2: TP403/AU-144P board (CH-2)  
(Address: Surface A, B-1)
3. Insert an alignment tape CR8-1A PS, and play back the 10 kHz audio signal.
4. Adjust the scope for horizontal and vertical amplitude to 6 cm of a lissajous waveform.
5. Make sure that the vertical amplitude at the center of the horizontal direction satisfies the required specification.  
If the specification is satisfied, perform step 9 and later.  
If the specification is not satisfied, perform step 6 and later.
6. Loosen a fixing screw by 1/4 to 1/2 turn.
7. Adjust it by turning azimuth adjustment screw to meet the required specification.
8. Tighten a fixing screw, and make sure once again that the specification is satisfied.
9. Stand the unit keeping the connector box down.
10. Playback the audio 10 kHz signal, and make sure that satisfy the required specification.
11. After adjustment, put back the switch S5 on SS-46P board to "SLACK MUTE OFF" state.
12. Perform confirmation of video tracking at the drum exit side. (Refer to Section 4-3.)
13. Perform TC head position adjustment. (Refer to Section 4-12.)





## 4-12. TC HEAD POSITION ADJUSTMENT

### Adjustment flow chart



### Tools

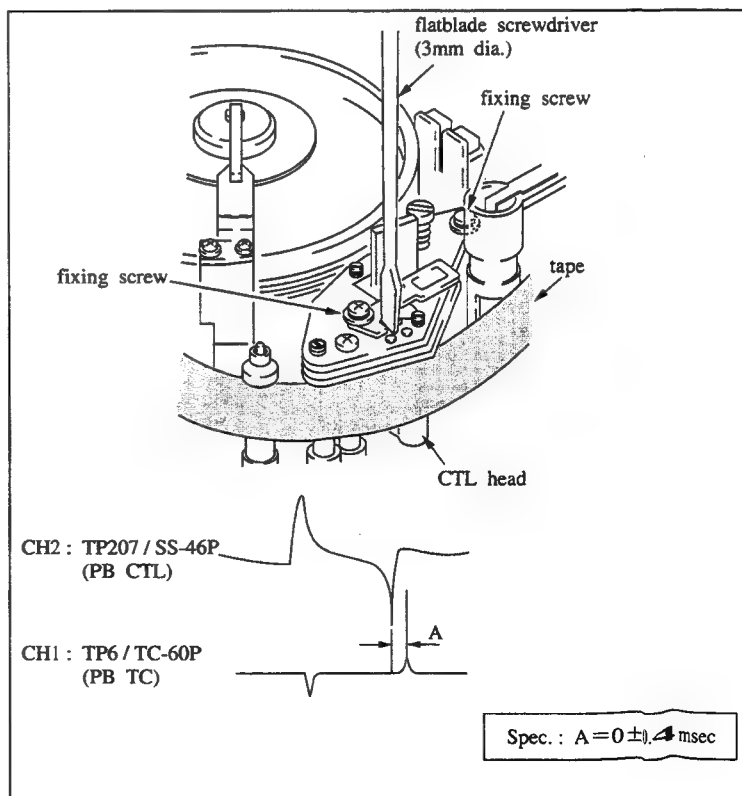
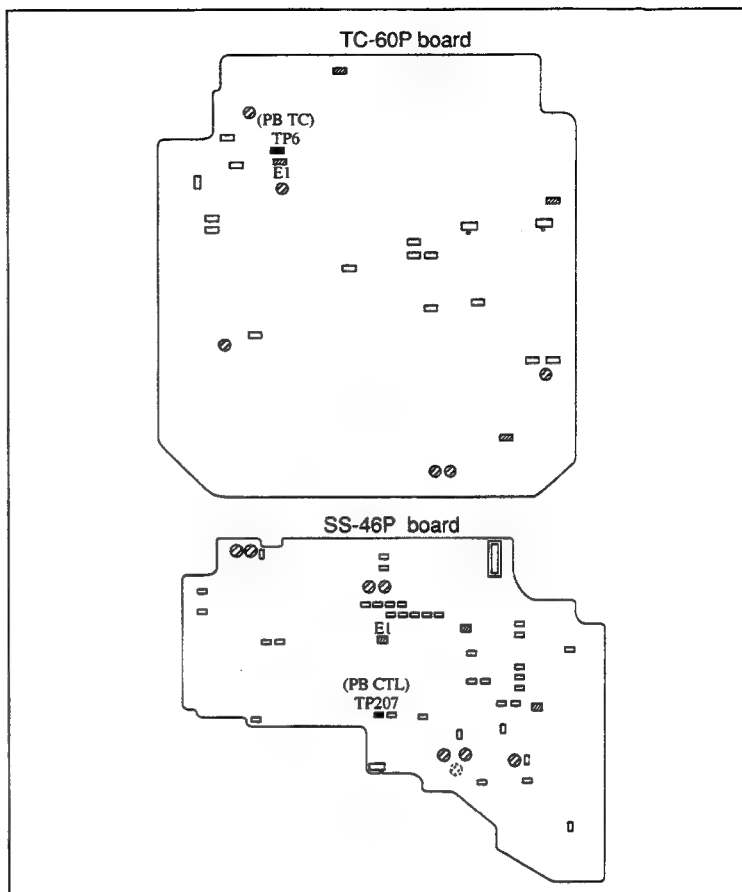
Alignment tape without lid CR2-1B PS:

8-960-096-51

Dual trace oscilloscope

### Adjustment

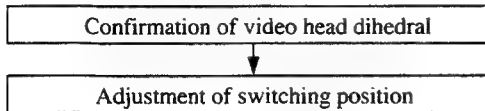
1. Connect the oscilloscope as follows.  
CH-1: TP6/TC-60P board  
(Address: Surface B, F-6) (PB TC)  
CH-2: TP207/SS-46P board  
(Address: Surface A, C-4) (PB CTL)  
TRIG: CH-1
2. Insert an alignment tape, and put the unit in PLAY mode.
3. Make sure that the positional relationship of the falling edge of the CTL signal waveform and the raising edge of the TC signal waveform satisfy the required specification.  
If the specification is not satisfied, perform step 4 and later.
4. Loosen two fixing screws by 1/4 to one turn.
5. Put a 3 mm dia. flatblade screwdriver at the position shown in the figure, adjust the position of the TC head in order to satisfy the required specification.
6. Tighten two fixing screws.
7. Make sure once again that the specification is satisfied.
8. Perform confirmation of audio phase.  
(Refer to Section 4-11.)



#### 4-13. VIDEO HEAD DIHEDRAL CONFIRMATION

- The video head dihedral for the unit and spare part is precisely adjusted in the factory. Therefore, this adjustment is not necessary in ordinary service operation.

##### Confirmation flow chart

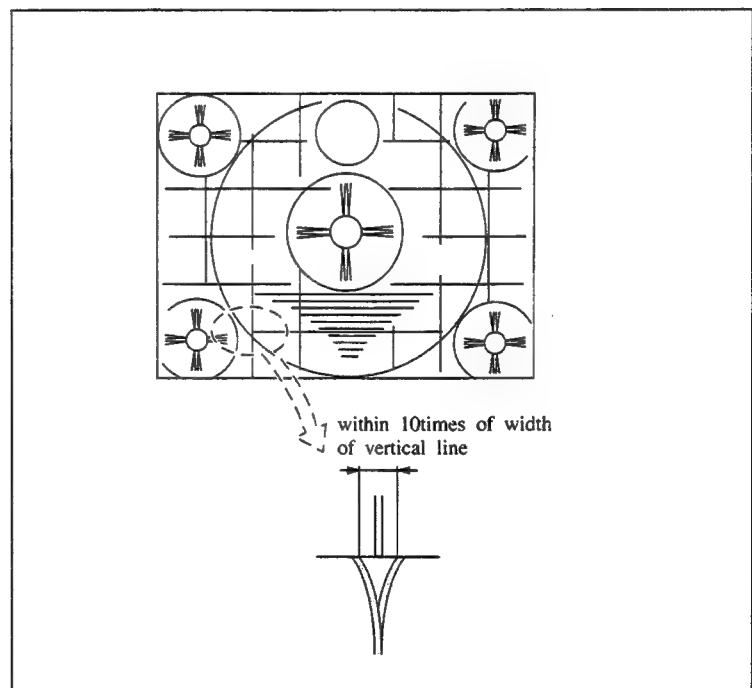
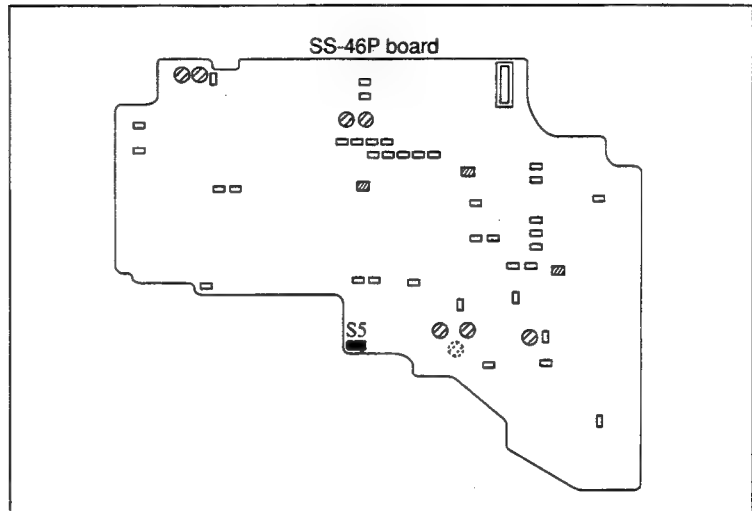


##### Tools

Camera tool (EW-783): J-6337-830-A  
Alignment tape CR5-2A PS: 8-960-098-44  
Monitor TV

##### Confirmation procedure

1. Put the switch S5 on SS-46P board in "SLACK MUTE ON" state.
2. Connect the camera tool.
3. Connect the monitor TV with the PB VIDEO terminal of the camera tool.
4. Insert an alignment tape CR5-2APS, and playback the monoscope signal portion.
5. Make sure if the vertical line of monoscope signal beneath the switching pulse is reproduced in double lines insted single line. Make sure that the space of the double line is within 10 times of width of the vertical line.
6. After confirmation, put back the switch S5 on SS-46P board to "SLACK MUTE OFF" state.
7. Perform switching position adjustment.  
(Refer to Section 4-14.)



# For PVV-1P

## 4-14. SWITCHING POSITION ADJUSTMENT

### Adjustment flow chart

Adjustment of switching position

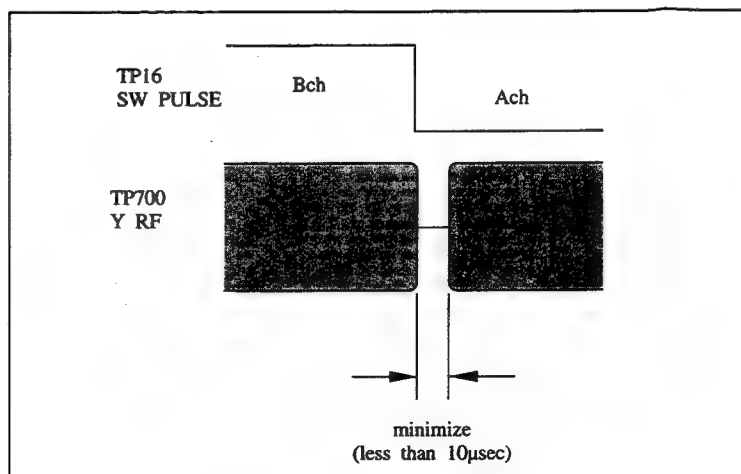
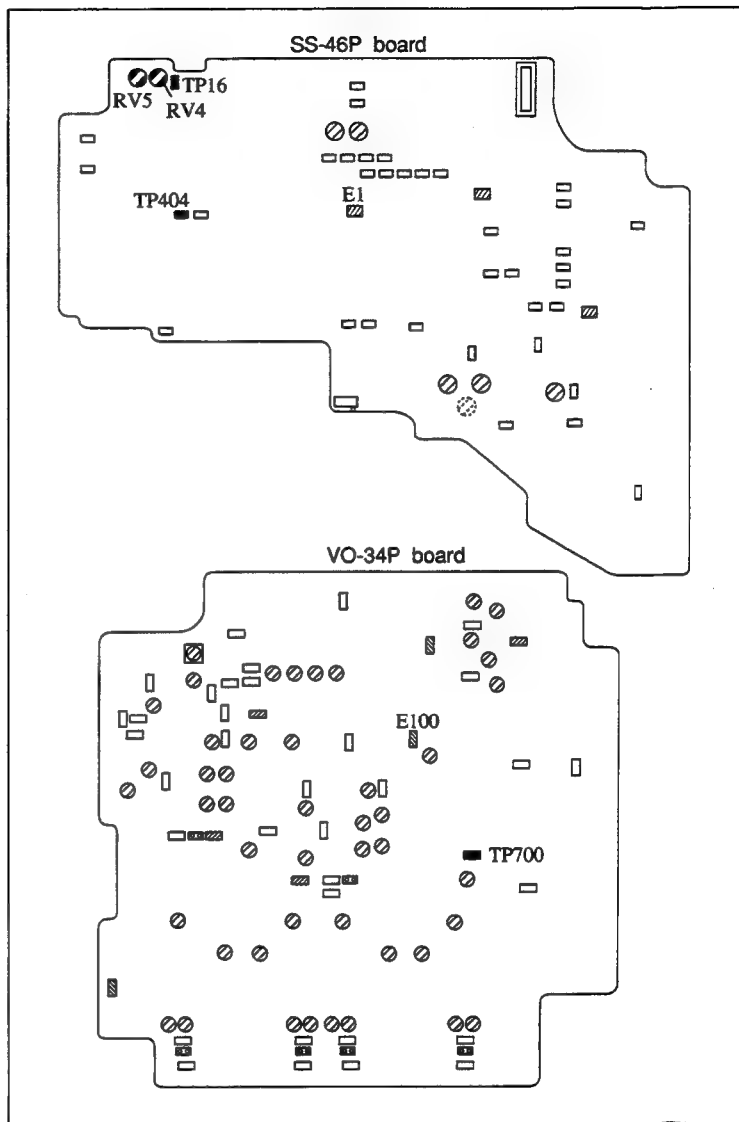
### Tools

Alignment tape CR2-1B PS: 8-960-096-51

Dual trace oscilloscope

### Adjustment

1. Connect the oscilloscope as follows.  
CH-1: TP404/SS-46P board  
(Address: Surface A, A-2) (Switching pulse)  
CH-2: TP700/VO-34P board  
(Address: Surface A, E-3) (Y-RF signal)
2. Insert an alignment tape CR2-1B PS and put the unit into PLAY mode.
3. Adjust RV4 so that minimize the missing area of the Y-RF waveform (rough adjustment).  
At this time, make sure that the level at TP16 on SS-46P board is "L".
4. Fine adjust RV5 so that the missing area of the Y-RF waveform is less than 10  $\mu$ sec.  
Make sure that the level at TP16 on SS-46P board is "L".



## For PVV-1AP

### 4-14. SWITCHING POSITION ADJUSTMENT

#### Adjustment flow chart

Adjustment of switching position

#### Tools

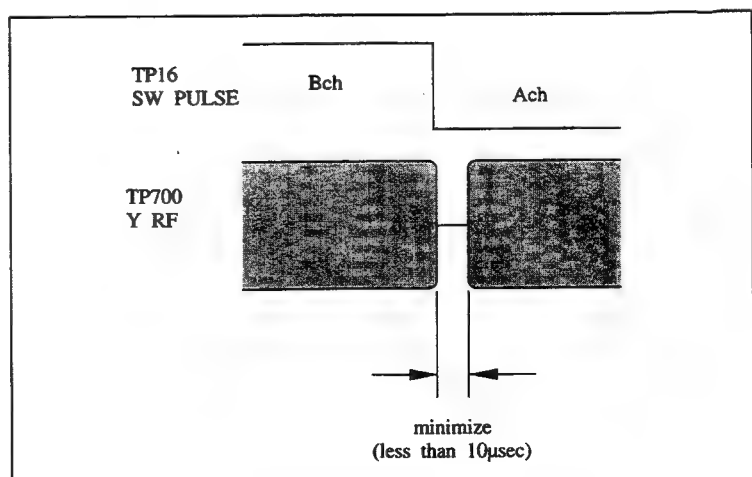
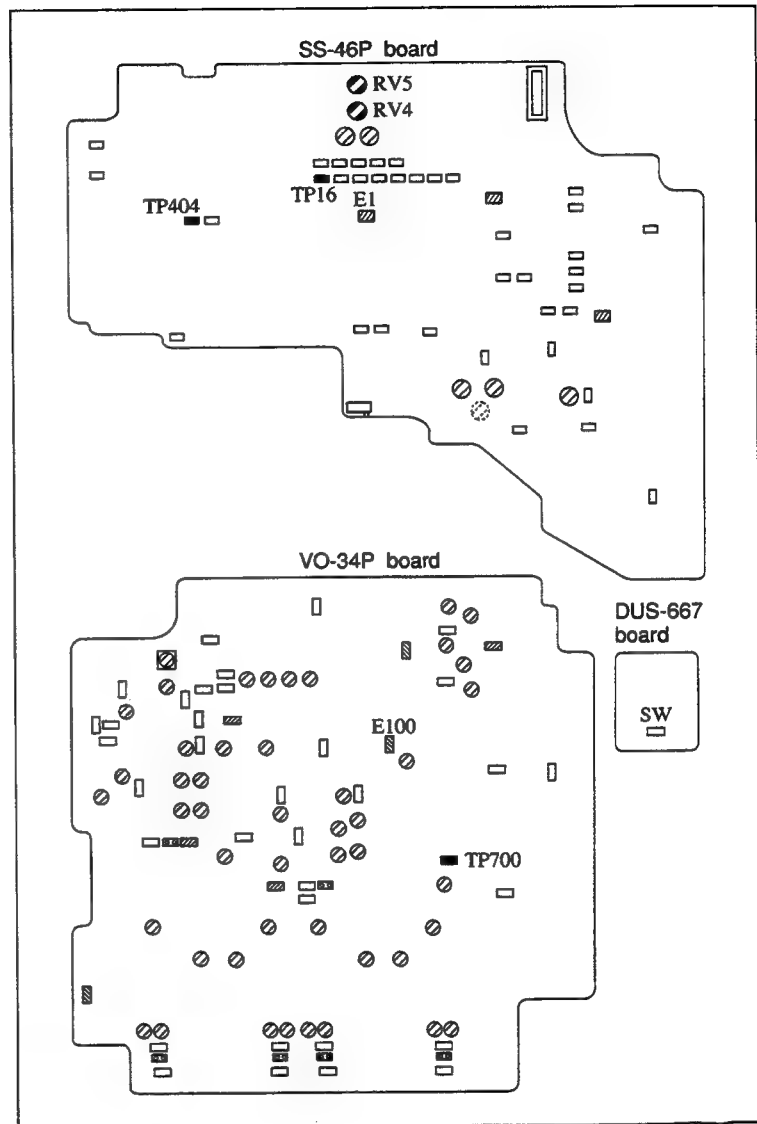
Alignment tape CR2-1B PS: 8-960-096-51  
Dual trace oscilloscope

#### Setting

Switch (DUS-667/VO-34AP) set to "OFF".  
After this adjustment, set to "ON".

#### Adjustment

1. Connect the oscilloscope as follows.  
CH-1: TP404/SS-46P board  
(Address: Surface A, A-2) (Switching pulse)  
CH-2: TP700/VO-34P board  
(Address: Surface A, E-3) (Y-RF signal)
2. Insert an alignment tape CR2-1B PS and put the unit into PLAY mode.
3. Adjust RV4 so that minimize the missing area of the Y-RF waveform (rough adjustment).  
At this time, make sure that the level at TP16 on SS-46P board is "L".
4. Fine adjust RV5 so that the missing area of the Y-RF waveform is less than 10  $\mu$ sec.  
Make sure that the level at TP16 on SS-46P board is "L".



## SECTION 5

### GENERAL INFORMATION FOR ELECTRICAL ALIGNMENT

#### 5-1. EQUIPMENT REQUIRED FOR ALIGNMENT

Measuring equipment	<ul style="list-style-type: none"> <li>• Oscilloscope (Tektronix 2445/100MHz or equivalent)</li> <li>• Waveform/vector monitor (Tektronix 1751 or equivalent)</li> <li>• Component waveform monitor (Tektronix WFM300 or equivalent)</li> <li>• Spectrum analyzer</li> <li>• Audio level meter (balance input type)</li> <li>• Digital voltmeter</li> </ul>
Signal generator	<ul style="list-style-type: none"> <li>• Component signal generator (Tektronix TSG300 or equivalent)</li> <li>• Sweep generator (Tektronix TSG130 MODEL 03/leader 425: BETACAM SP Spec.)</li> <li>• Audio signal generator (balance output type)</li> </ul>
Tool for PVV-1P	<ul style="list-style-type: none"> <li>• Camera tool EW-783 (J-6337-830-A) Camera tool has terminals of every kind component video signal input, play back video signal output, mic signal input and earphone output for camera.</li> <li>• Connection cable EW-804 (J-6338-040-A) This is connection cable to connect the servo remote control tool EW-229 with PVV-1P, use for servo system alignment.</li> </ul>
General tool	<ul style="list-style-type: none"> <li>• Servo remote control tool EW-229 (J-6332-290-A) Use servo remote control tool EW-229 for servo system alignment. When not using this tool, adjust using a shooting clip. But when tracking is shifted for video tracking adjustment, tracking is not shifted without this tool.</li> <li>• Deviation checker EW-579 (J-6335-790-A) You have spectrum analyzer, and deviation checker is not necessary.</li> <li>• Alignment tape CR2-1B PS (8-960-096-51) CR5-1B PS (8-960-096-91) CR8-1A PS (8-960-098-45) CR8-1B PS (8-960-096-86)</li> <li>• Metal particle tape</li> <li>• Standard play back machine Standard play back machine shall be adjusted audio head phase, play back frequency response of audio system, and play back video phase, play back Y/C delay, play back C/C delay of video system.</li> <li>• DC power supply (AC-500CE, CMA-8ACE)</li> <li>• Variable DC power supply (This is enable to adjusted to 11 ~ 12 V)</li> </ul>

#### 5-2. ELECTRICAL ALIGNMENT WITH REPLACEMENT OF MECHANICAL PARTS

##### 5-2-1. Electrical Alignment After Upper/Head Drum Assy

- Recording current secondary distortion adjustment (refer to sections 9-2-11, 9-2-14, 9-3-13, and 9-3-14)
- Recording current frequency response/recording current level adjustment (refer to sections 9-2-13, 9-2-14, 9-3-15, and 9-3-16)
- Play back RF level adjustment (refer to sections 9-4-1, and 9-4-2)
- RF alarm adjustment (refer to section 9-4-4)

##### 5-2-2. Electrical Alignment After Audio Head Replacement

- Perform all audio system alignment. (refer to sections 8-1 through 8-10)

##### 5-2-3. Electrical Alignment After Capstan Motor Replacement

- Perform all servo system alignment. (refer to sections 7-1 through 7-3)

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## SECTION 6 POWER SYSTEM ALIGNMENT

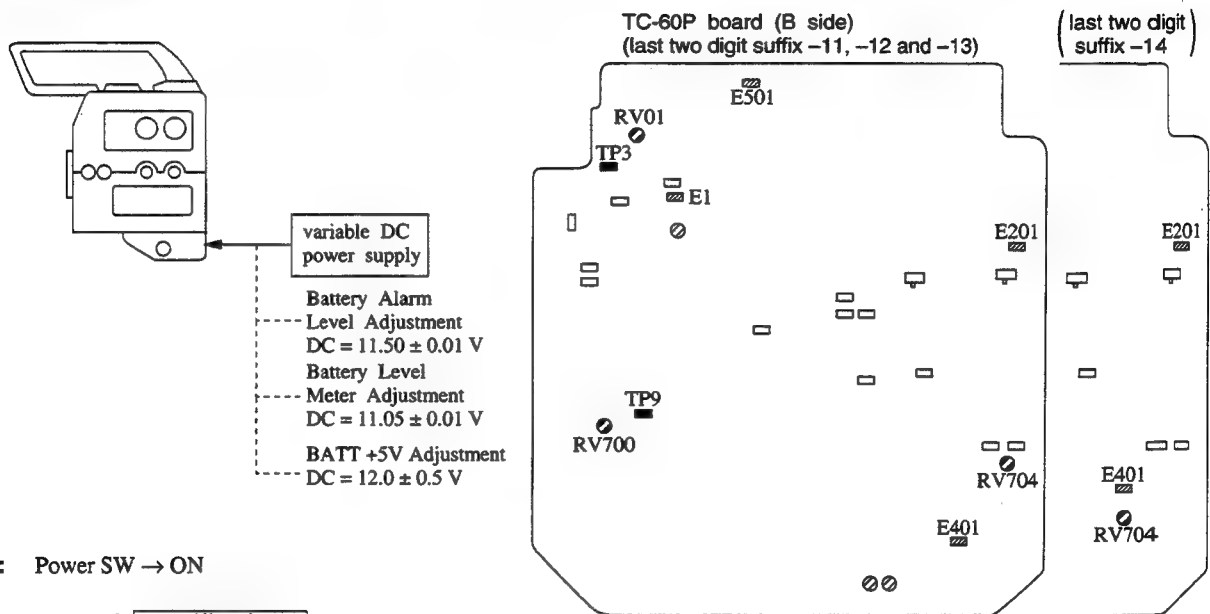
### Equipment required

- Digital voltmeter
- Variable DC power supply (This is enable to be adjust to 11~12 V.)

### 6-1. BATT +5 V/BATTERY LEVEL METER / BATTERY ALARM LEVEL ADJUSTMENT

**Equipment required :** Digital voltmeter or oscilloscope  
**Tool and connection:**

**Location :**



**Mode :** Power SW → ON

### Adjustments and specifications :

1. Battery +5 V adjustment ----- Set the power supply voltage at  $12.0 \pm 0.5$  V dc and make adjustment.

Measuring Point

Adjustment Point

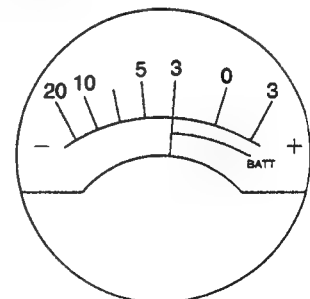
■ TP3 ----- ● RV01 =  $5.40^{+0}_{-0.05}$  V

2. Battery level meter adjustment --- Set the power supply voltage at  $11.05 \pm 0.01$  V dc and make adjustments by pressing the **(BATT SW)** located on the side of the panel.

Measuring Point

Adjustment Point

Indicated value of the CH-2/BATT meter --- ● RV704 =  $-3$  Vu  $\pm$  within one width of pointer



CH2/BATT Meter

3. Battery alarm level adjustment ----- Set the power supply voltage at  $11.50 \pm 0.01$  V dc and make adjustments.

Measuring Point

Adjustment Point

■ TP9 ----- ● RV700 =  $1.75 \pm 0.01$  V





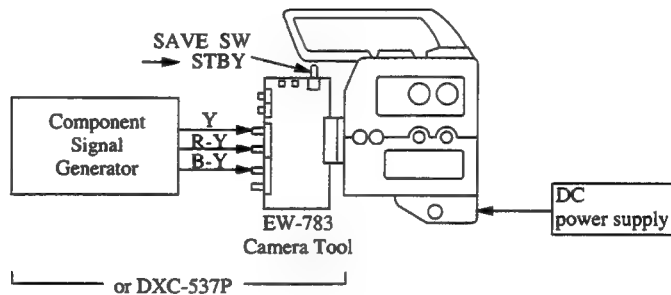
## SECTION 7 SERVO SYSTEM ALIGNMENT

### Equipment required

- a. Using servo remote control tool (EW-229)
- Oscilloscope (Tektronix 2445/100MHz or equivalent)
  - Servo remote control tool EW-229 (J-6332-290-A)
  - Connection cable EW-804 (J-6338-040-A)
  - DC power supply (AC-500CE, CMA-8ACE)
- b. Not using servo remote control tool (EW-229)
- Oscilloscope (Tektronix 2445/100MHz or equivalent)
  - Camera tool EW-783 (J-6337-830-A)
  - Component signal generator (Tektronix TSG300 or equivalent) ☐ or camera DXC-537P
  - DC power supply (AC-500CE, CMA-8ACE)
  - Metal particle tape
  - Shoring clip x2

### REC mode

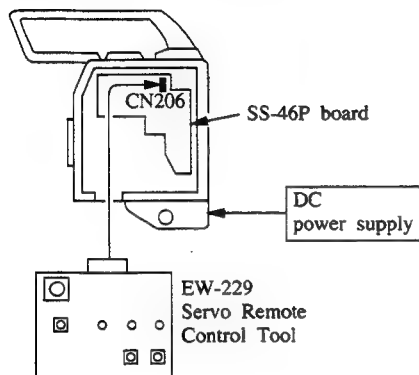
- Input COMP SYNC signal from camera 50 pin connector to put the unit into REC mode. Connect the unit with camera tool or camera DXC-537P.



## 7-1. CAPSTAN / FG DUTY ADJUSTMENT --- a) USING A SERVO REMOTE CONTROL TOOL (EW-229)

**Equipment required :** Oscilloscope

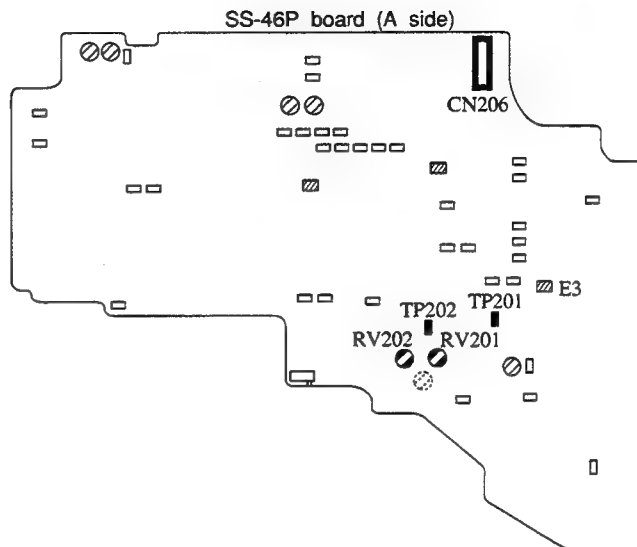
**Tool and connection :**



Setting of the EW-229

MODE SW → C  
REC SERVO SW → OFF  
TRACON SW → OFF  
SW POSITION SW → OFF

**Location :**



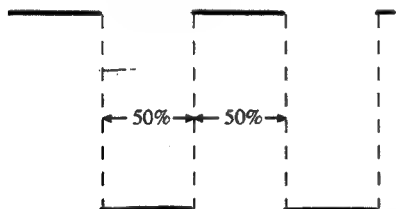
**Input signal :** \_\_\_\_\_

**Mode :** Mode of the servo remote control tool

**Adjustments and specifications :**

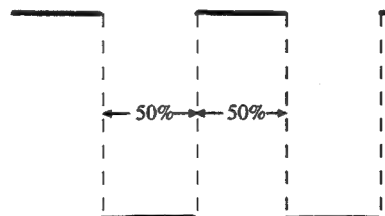
- Put the **REC SERVO SW** on the servo remote control tool into ON from OFF, and adjust.

■ TP201 FGA



● RV201 = **DUTY ratio:  $50 \pm 2\%$**   
at the center of jitter

■ TP202 FGB



● RV202 = **DUTY ratio:  $50 \pm 2\%$**   
at the center of jitter

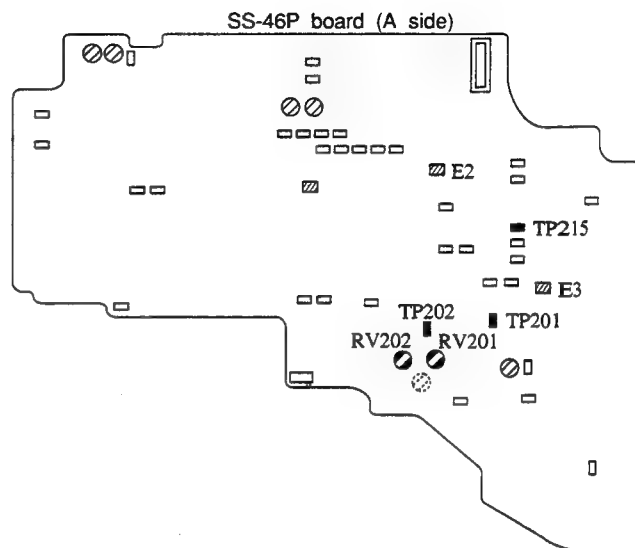
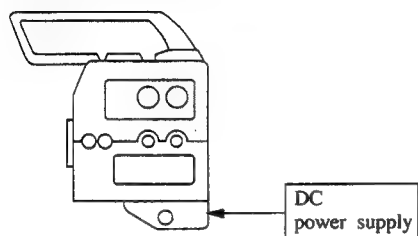
- After adjustment, put the **REC SERVO SW** on the servo remote control tool into OFF, and then put the **MODE SW** switch into F.

## CAPSTAN / FG DUTY ADJUSTMENT --- b) NOT USING SERVO REMOTE CONTROL TOOL (EW-229)

**Equipment required :** Oscilloscope

**Tool and connection :** Shorting clip ×1

**Location :**



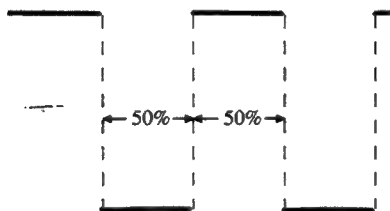
**Input signal :** \_\_\_\_\_

**Mode :** \_\_\_\_\_

**Adjustments and specifications :**

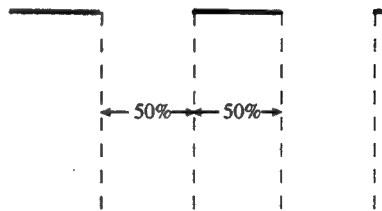
1. Short with a **(shorting clip)** between ■TP215 and GND to adjust.

■TP201 FGA



●RV201 = **DUTY ratio:  $50 \pm 2\%$**   
at the center of jitter

■TP202 FGB



●RV202 = **DUTY ratio:  $50 \pm 2\%$**   
at the center of jitter

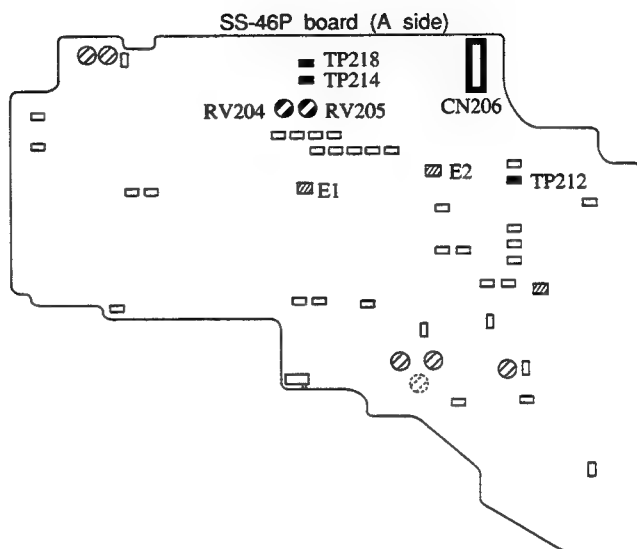
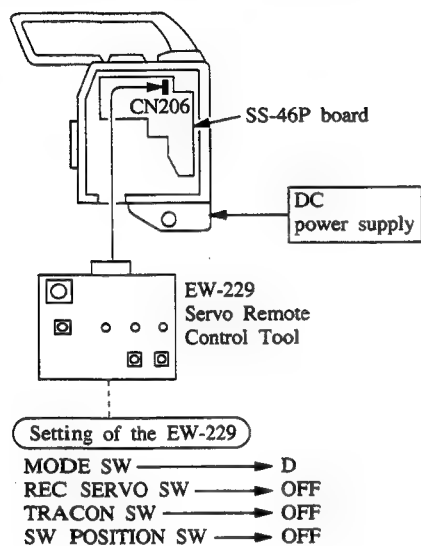
2. After adjustment, remove the **(shorting clip)**.

## 7-2. CAPSTAN / FREE SPEED ADJUSTMENT --- a) USING A SERVO REMOTE CONTROL TOOL (EW-229)

Equipment required : Oscilloscope

Tool and connection :

Location :



Input signal : \_\_\_\_\_

Mode : mode of the servo remote control tool

Adjustments and specifications :

- Put the **REC SERVO SW** on the servo remote control tool into ON from OFF. Confirm specifications 1 and 2, and then adjust.

Specifications 1 ---Capstan rotates.

■TP212 is 5V.

within 40 seconds

Specifications 2 ---Capstan stops.

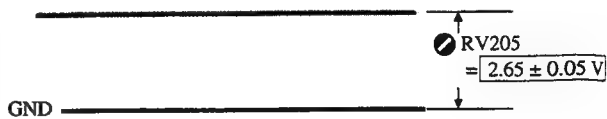
■TP212 is 0V. --- If not, confirm section 7-1 Capstan/FG DUTY adjustment.

- Rough adjustment

- Fine adjustment

Put the **SW POSITION SW** into ON from OFF.

■TP218 If the specification is out of spec. indicates 0V or 5V. ■TP218 If the specification is out of spec. indicates 0V or 5V.

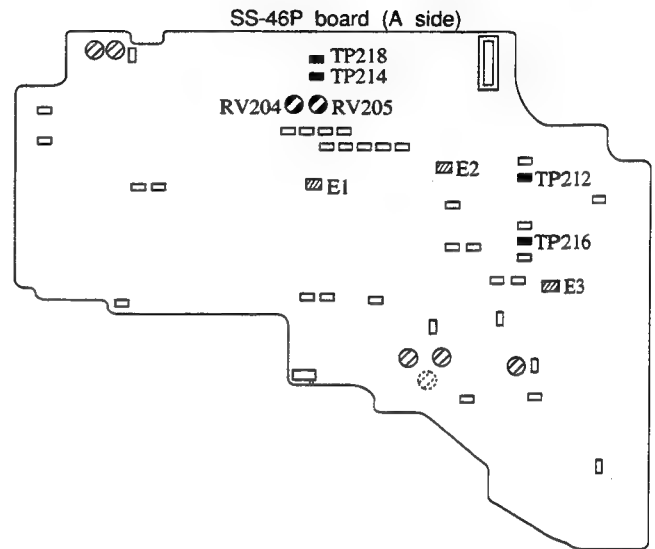
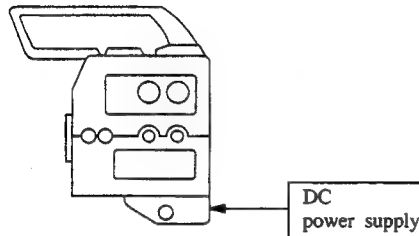


- After adjustment, put the **REC SERVO SW** into OFF, put the **SW POSITION SW** into OFF and the **MODE SW** into F.

# **CAPSTAN / FREE SPEED ADJUSTMENT --- b) NOT USING A SERVO REMOTE CONTROL TOOL (EW-229)**

**Equipment required :** Oscilloscope  
**Tool and connection :** Shorting clip x2

**Location :**



**Input signal :** \_\_\_\_\_  
**Mode :** \_\_\_\_\_

## **Adjustments and specifications :**

1. Short with a **(shorting clip)** between **■TP216** and GND. Confirm specifications 1 and 2, and then adjust.

Specifications 1 --- Capstan rotates.  
 --- **■TP212** is 5V.

within 40 seconds

Specifications 2 --- Capstan stops.  
 --- **■TP212** is 0V. --- If not, confirm section 7-1 Capstan/FG DUTY adjustment.

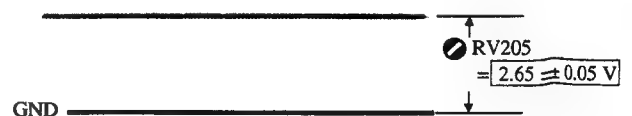
2. Rough adjustment

**■TP218** If the specification is out of spec. indicates 0V or 5V.

3. Fine adjustment

Short with a **(shorting clip)** between **■TP214** and GND.

**■TP218** If the specification is out of spec. indicates 0V or 5V.



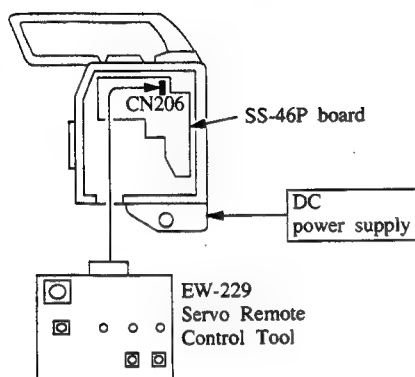
4. After adjustment, remove a **(shorting clip)**.

### 7-3. CAPSTAN / STOP SERVO ADJUSTMENT --- a) USING A SERVO REMOTE CONTROL TOOL (EW-229)

Equipment required : Oscilloscope

Location :

Tool and connection :

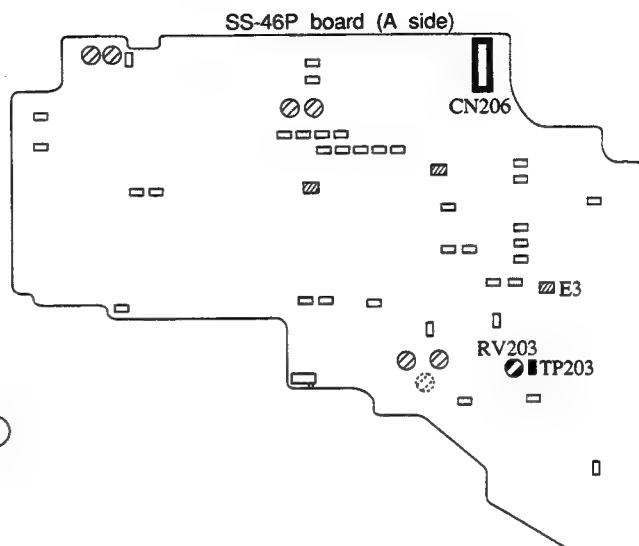


#### Setting of the EW-229

MODE SW → 4  
REC SERVO SW → OFF  
TRACON SW → OFF  
SW POSITION SW → OFF

#### Setting of the Oscilloscope

TRIG → OFF  
20μ SEC/DIV  
0.5V/DIV DC



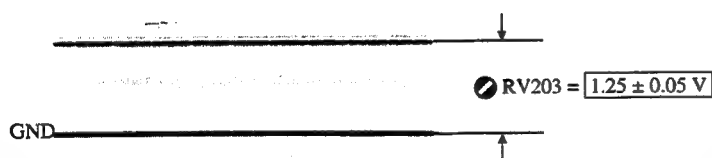
Input signal : \_\_\_\_\_

Mode : mode of the servo remote control tool

#### Adjustments and specifications :

- Put the **REC SERVO SW** on the servo remote control tool into ON from OFF, and adjust.

■ TP203



**NOTE:** If the waveform does not change, slightly rotate the volume control clockwise, turn on the **REC SERVO SW** again, and then make adjust.

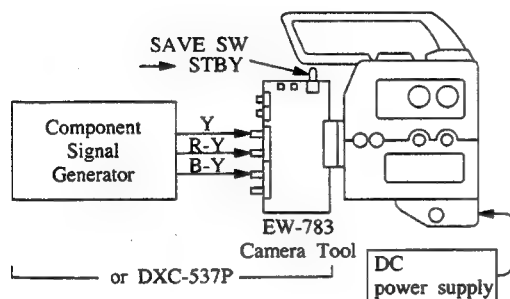
- After adjustment, put the **REC SERVO SW** into OFF, and put the **MODE SW** into F on the servo remote control tool.

# **CAPSTAN / STOP SERVO ADJUSTMENT --- b) NOT USING A SERVO REMOTE CONTROL TOOL (EW-229)**

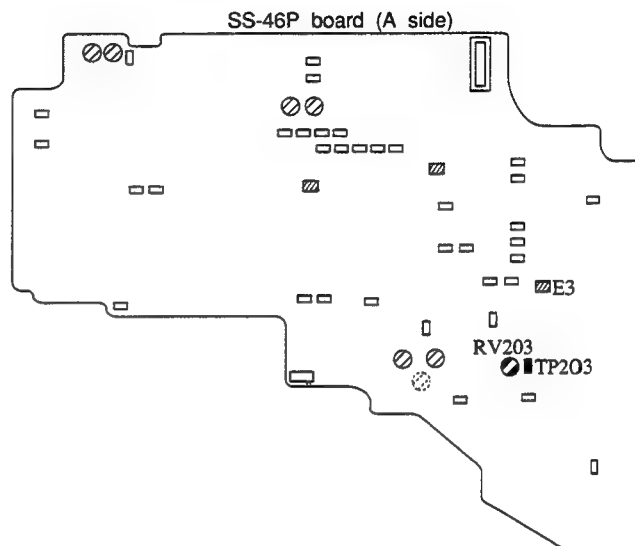
**Equipment required :** Oscilloscope

**Tool and connection :** Metal particle tape

**Location :**



Setting of the Oscilloscope  
 TRIG → OFF  
 20μ SEC/DIV  
 0.5V/DIV DC



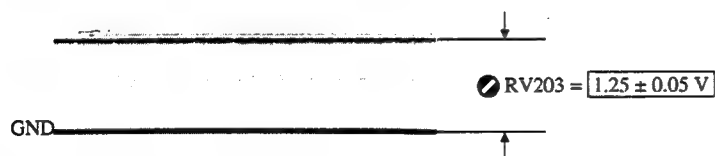
**Input signal :** Any signal (with SYNC)

**Mode :** REC PAUSE mode (metal particle tape)

**Adjustments and specifications :**

1. Put the **VTR S/S SW** on the camera tool into REC PAUSE mode, and adjust.

■ TP203



**NOTE:** If the waveform does not change, slightly rotate the volume control clockwise, turn on the REC PAUSE mode from REC mode, and then adjust.





## SECTION 8

### AUDIO SYSTEM ALIGNMENT

#### Equipment required

- Audio level meter (balance input type)
- Oscilloscope (Tektronix 2445 or equivalent)
- Audio signal generator (balance output type)
- Camera tool EW-783 (J-6337-830-A)
- Component signal generator (Tektronix TSG300 or equivalent) ☐ or camera DXC-537P
- Standard play back machine
- DC power supply (AC-500CE, CMA-8ACE)
- Alignment tape CR8-1A PS (8-960-098-45)
- Metal particle tape

**NOTE:** Standard play back machine shall be adjusted audio head phase, play back frequency and play back level.

**NOTE:** Alignment tape CR8-1A PS is an oxide tape, so that the alignment tape is ejected even if it is inserted. For that, put the SLACK MUTE SW (S5/SS-46P board) to ON, and use it.

#### Alignment tape contents

CR8-1A PS (8-960-098-45)

TIME min. sec	AUDIO TRACK	VIDEO TRACK	CTL TRACK	FOR USE
0: 00	1 kHz, 0 VU*1	—	CTL	Audio play back level adjustment
2: 55	Blank			
3: 00	10 kHz, -10 VU	—	CTL	Audio head azimuth adjustment
4: 55	Blank			
5: 00	1 kHz, -20 VU	—	CTL	Audio play back frequency response adjustment
5: 55	Blank			
6: 00	40 Hz, -20 VU*2	—	CTL	
6: 25	Blank			
6: 30	7 kHz, -20 VU*2	—	CTL	
6: 55	Blank			
7: 00	10 kHz, -20 VU*2	—	CTL	
7: 25	Blank			
7: 30	15 kHz, -20 VU*2	—	CTL	
7: 55	Blank			
8: 00	1 kHz, 0 VU	—	1 kHz, 0 VU	Audio head height adjustment CTL head height adjustment
10: 00	1 kHz, 0 VU			

**NOTE:**

\*1 When the tape is played back to check or adjust the audio reference level, the output level (0dB) should be calibrated in accordance with the value described below.

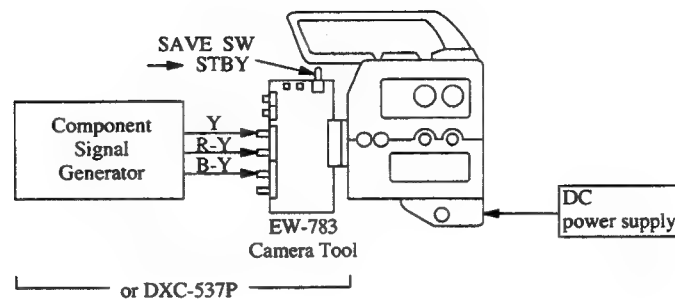
Example: Calibration level = -0.5 dB

Output level = 0 dB - 0.5 dB = -0.5 dB

\*2 When the tape is played back to check or adjust the audio frequency response, the output level should be calibrated with the calibration value.

## REC mode

- Input COMP SYNC signal from camera 50 pin connector to put the unit into REC mode. Connect the unit with camera tool or camera DXC-537P.

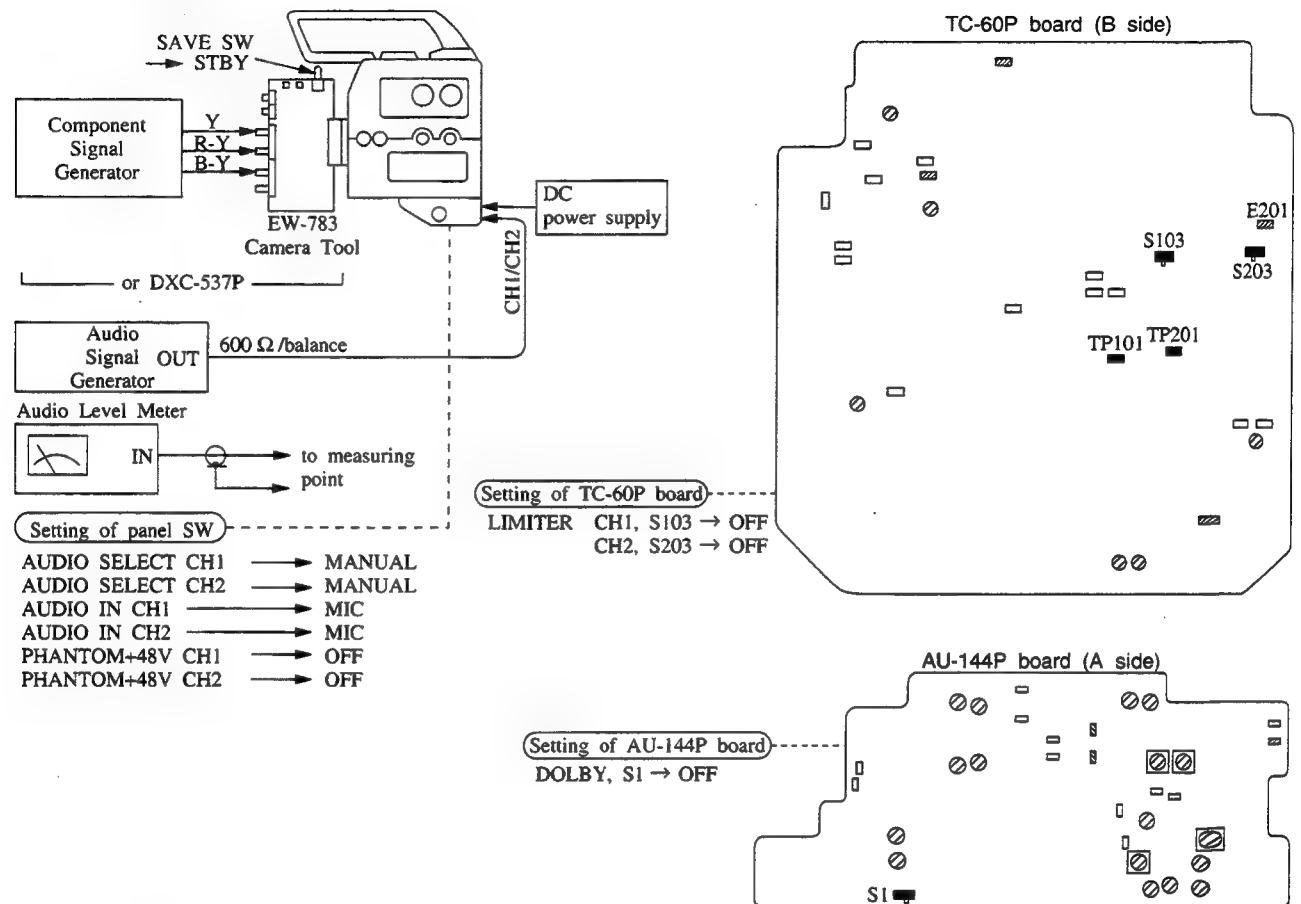


## 8-1. AUDIO LEVEL VOLUME REFERENCE POSITION ADJUSTMENT

**Equipment Required :** Audio level meter

**Location:**

**Tool and connection :**



**Input signal:** 1 kHz, -60 dBu

**Mode:** STANDBY mode

**Adjustments and specifications:**

Measuring Points Adjustment points on the side panel

■ TP101(CH-1) -----● CH-1 AUDIO LEVEL knob

■ TP201(CH-2) -----● CH-2 AUDIO LEVEL knob

Specifications

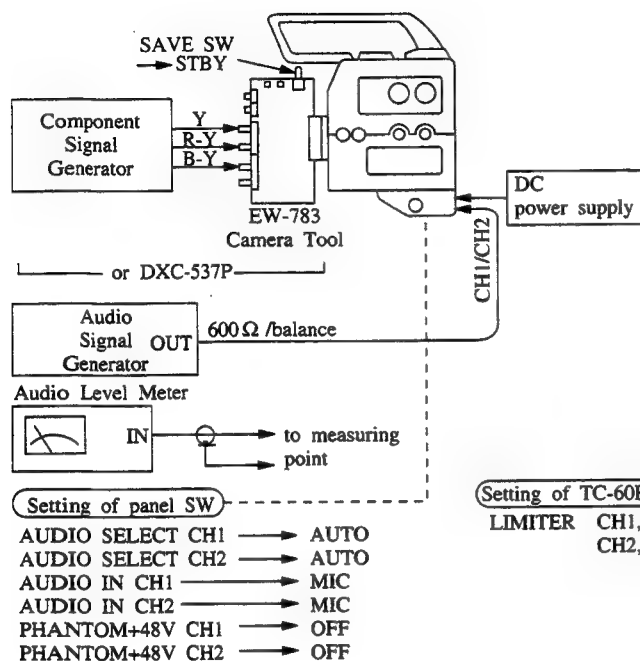
-10.0  $\pm$  0.1 dBu

**NOTE:** Never change the volume reference position during Audio system alignment.

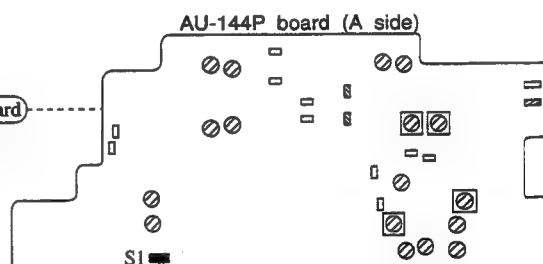
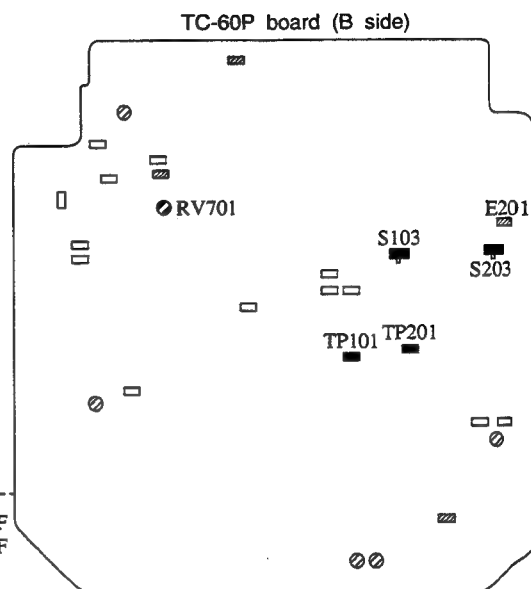
## 8-2. AGC LEVEL ADJUSTMENT

**Equipment required:** Audio level meter

**Tool and connection:**



**Location:**



**Input signal:** 1 kHz, -60 dBu

**Mode:** STANDBY mode

**Adjustments and specifications:**

Adjust both CH-1 and CH-2 meet the specifications.

Measuring Points Adjustment Point

■ TP101(CH-1) --- ● RV701

■ TP201(CH-2) ---

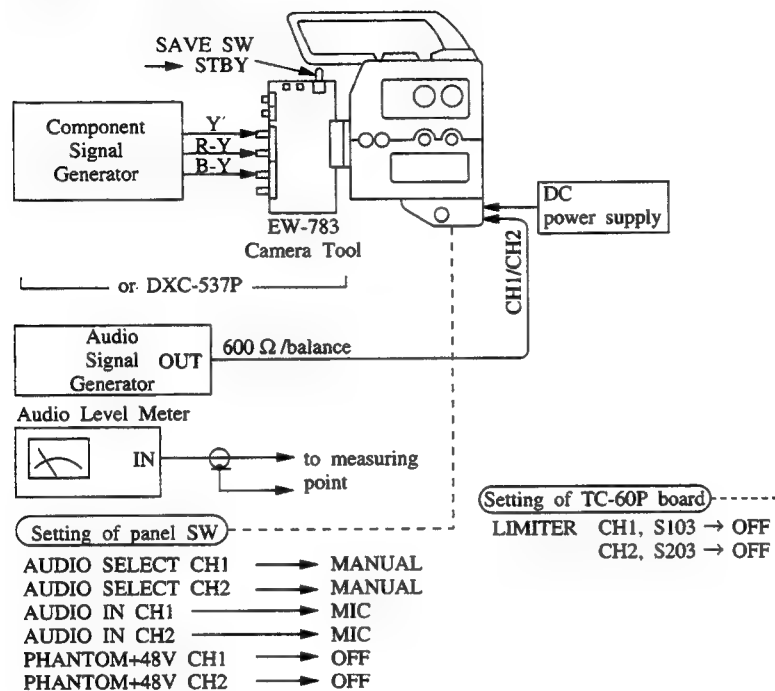
Specifications

-10.0 ± 0.2 dBu

### 8-3. DOLBY INPUT LEVEL ADJUSTMENT

**Equipment required:** Audio level meter

**Tool and connection :**

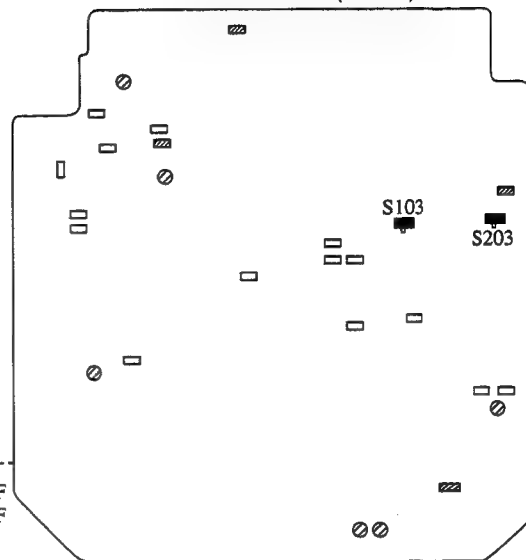


Setting of TC-60P board

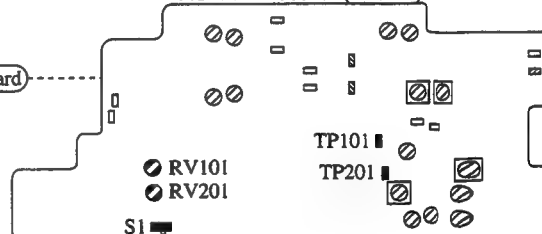
LIMITER CH1, S103 → OFF

CH2, S203 → OFF

TC-60P board (B side)



AU-144P board (A side)



Setting of AU-144P board

DOLBY, S1 → OFF

**Input signal:** 1 kHz, -60 dBu

**Mode:** STANDBY mode

**Adjustments and specifications:**

Measuring Points	Adjustment Points
■ TP101(CH-1) -----	● RV101
■ TP201(CH-2) -----	● RV201

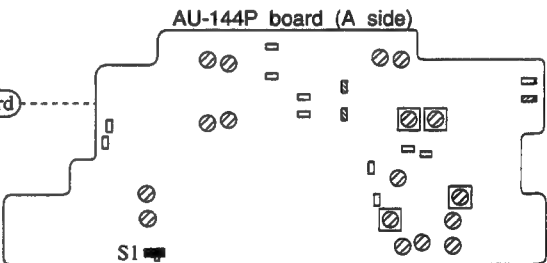
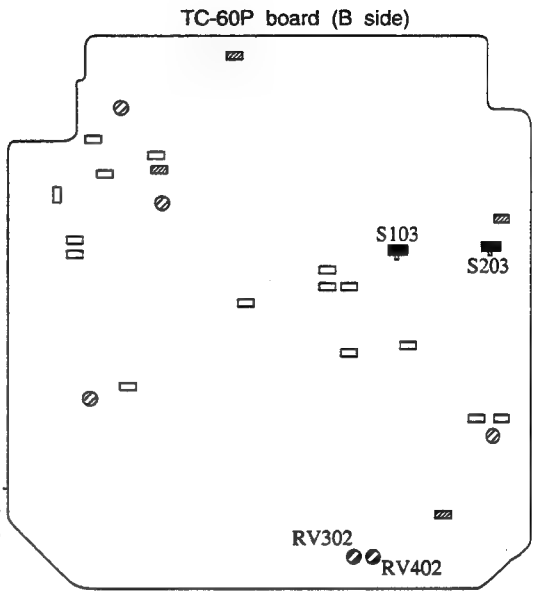
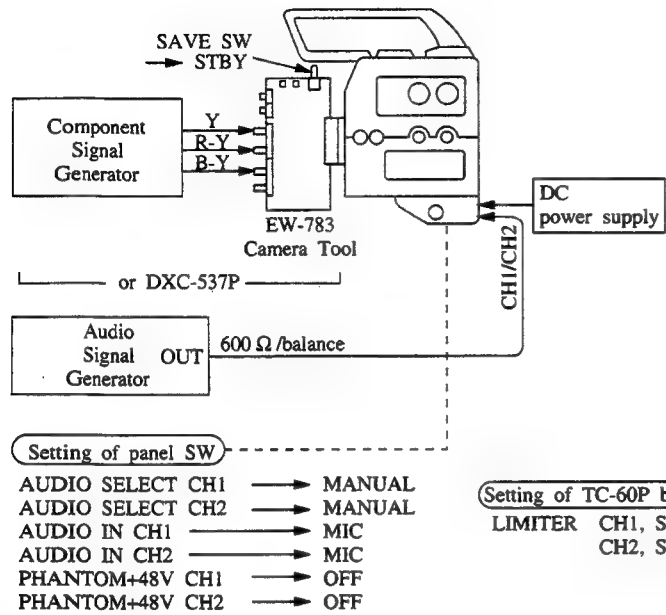
**Specifications**

-10.0 ± 0.1 dBu

8-4. AUDIO LEVEL METER ADJUSTMENT

Equipment required: \_\_\_\_\_  
Tool and connection :

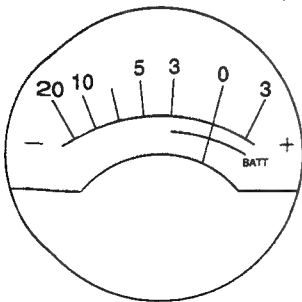
Location:



Input signal: 1 kHz, -60 dBu  
Mode: STANDBY mode  
Adjustments and specifications:

Measuring Points ----- Adjustment Points  
Indication value of Audio Level Meter (CH-1)---- ● RV302  
(CH-2)---- ● RV402

Specifications  
O VU ± within one width of pointer

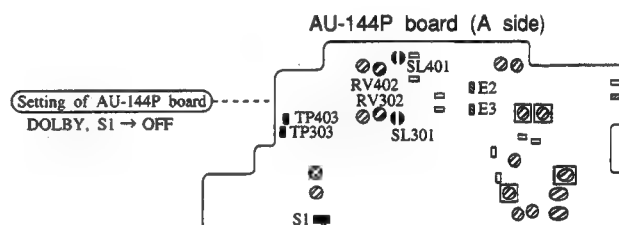
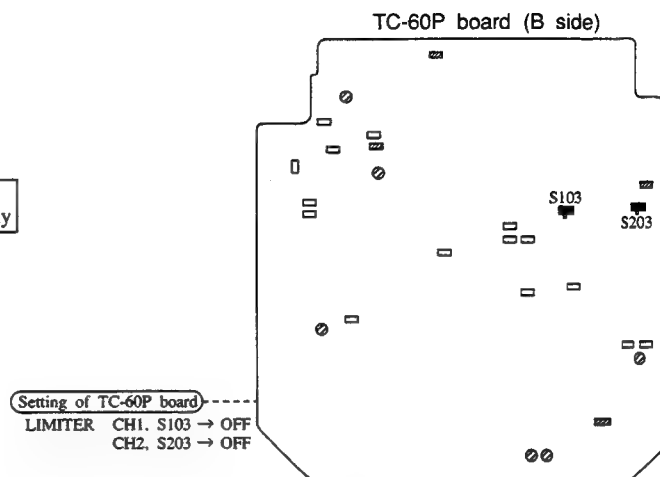
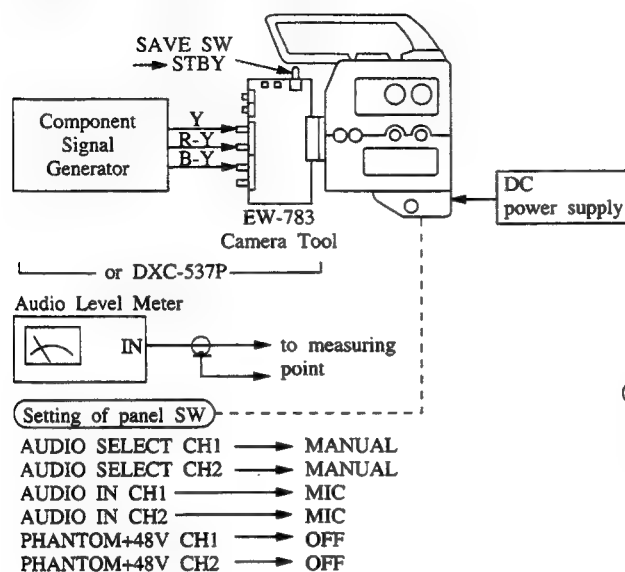


## 8-5. PLAY BACK FREQUENCY RESPONSE ADJUSTMENT

**Equipment required:** Audio level meter

**Tool and connection :** Alignment tape CR8-1A PS

**Location:**



**Signal:** Alignment tape CR8-1A PS (1 kHz through 15 kHz, -20 VU)

**Mode:** PB mode

**Adjustments and specifications :**

Adjust the level of each frequency within the specifications referring to the level of 1kHz play back.

Measuring Points	Adjustment Points
■TP303 (CH-1)	○RV302 (If the specification is not satisfied, solder ○SL301, and adjust.)
■TP403 (CH-2)	○RV402 (If the specification is not satisfied, solder ○SL401, and adjust.)

### Specifications

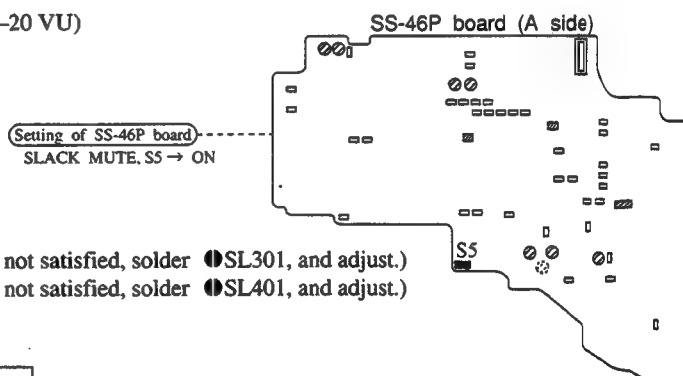
Frequency(Hz)	Level(dB)
1 k	reference
40	reference ± 3
7 k	reference ± 3
10 k	reference ± 3
15 k	reference ± 3

**NOTE:** When the alignment tape is played back, the play back output level (0dB) of used alignment tape should be calibrated with the value described below.

Example: Calibration value = -0.5 dB

Play back output level = 0 dB - 0.5 dB = -0.5 dB

After adjustment, turn the (S5/SS-46P board) to OFF. (SLACK MUTE OFF)

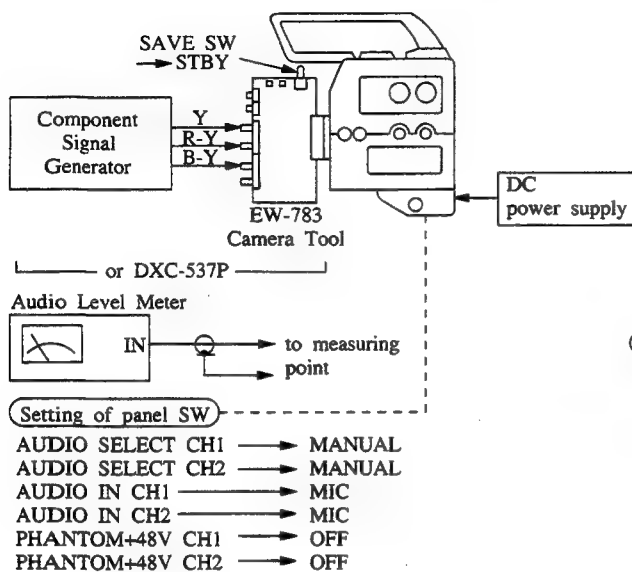


## 8-6. PLAY BACK LEVEL ADJUSTMENT

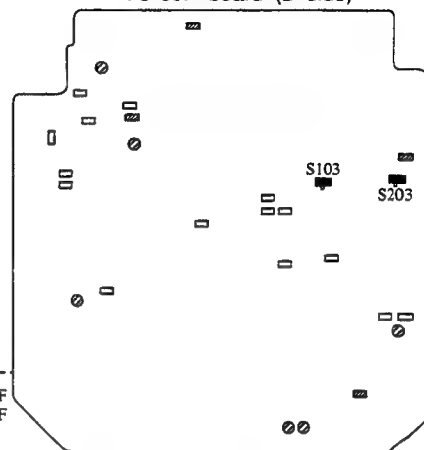
**Equipment required :** Audio level meter

**Tool and connection :** Alignment tape CR8-1A PS

**Location:**

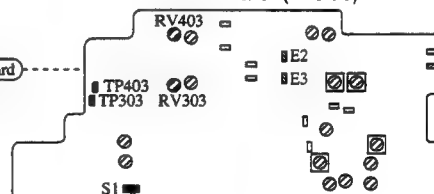


TC-60P board (B side)



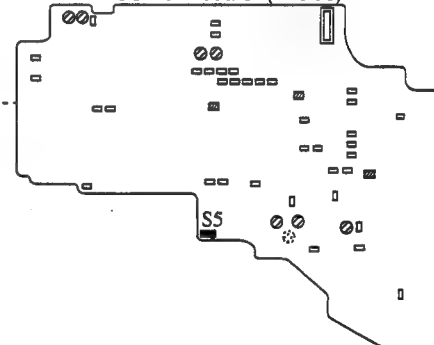
Setting of TC-60P board  
LIMITER CH1, S103 → OFF  
CH2, S203 → OFF

AU-144P board (A side)



Setting of AU-144P board  
DOLBY, S1 → OFF

SS-46P board (A side)



Setting of SS-46P board  
SLACK MUTE, S5 → ON

**Signal:** Alignment tape CR8-1A PS (1 kHz, 0 vu)

**Mode:** PB mode

**Adjustments and specifications:**

Measuring Points	Adjustment Points
TP303 (CH-1) -----	RV303
TP403 (CH-2) -----	RV403

Specifications

-10.0 ± 0.5 dBu

**NOTE:** When the alignment tape is played back, the play back output level (0 dB) of used alignment tape should be calibrated with the value described below.

Example: Calibration value = -0.5 dB

Play back output level = 0 dB - 0.5 dB = -0.5 dB

After adjustment, turn the (S5/SS-46P board) to OFF. (SLACK MUTE OFF)

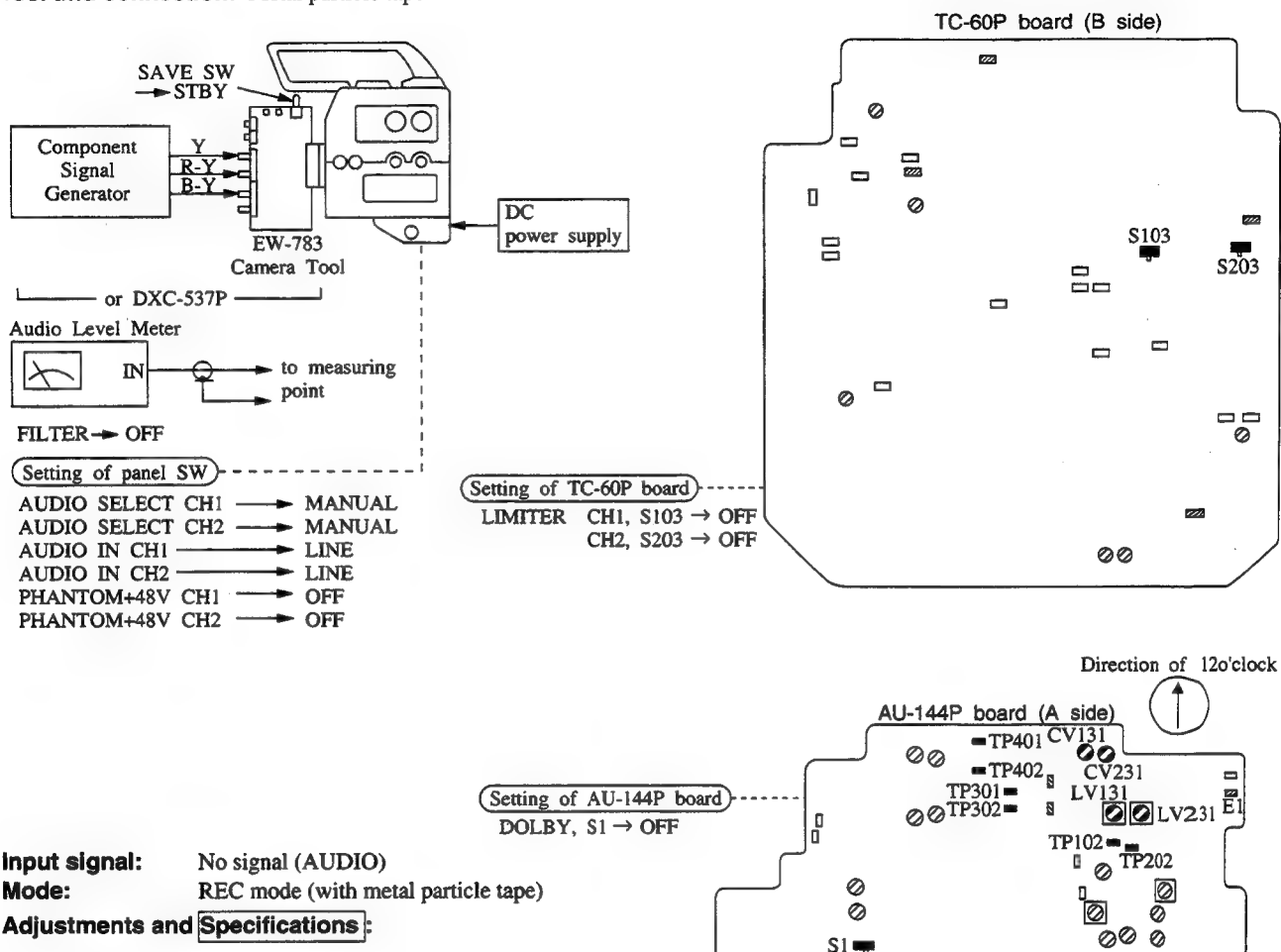


## 8-7. BIAS TRAP / BIAS LEVEL ADJUSTMENT

**Equipment required:** Oscilloscope, Audio level meter

**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** No signal (AUDIO)

**Mode:** REC mode (with metal particle tape)

**Adjustments and Specifications:**

### 1. Bias trap adjustment (oscilloscope)

Preset CV131 and CV231 in the direction of 12 o'clock position, and then adjust.

Measuring Points	Adjustment Points	Specification
■ TP102 (CH-1) -----	⊗ LV131	Minimize (less than 250 mVp-p)
■ TP202 (CH-2) -----	⊗ LV231	

**NOTE:** CH-1 and CH-2 influences each other, so adjust then repeatedly, and then confirm.

### 2. Bias level adjustment (audio level meter)

Measuring Points	Adjustment Points	Specifications
Level of between ■ TP301 and ■ TP302 (CH-1) -----	⊗ CV131	$16.0 \pm 0.5 \text{ mVrms}$
Level of between ■ TP401 and ■ TP402 (CH-2) -----	⊗ CV231	

**NOTE:** CH-1 and CH-2 influence each other, so adjust then repeatedly, and then confirm.

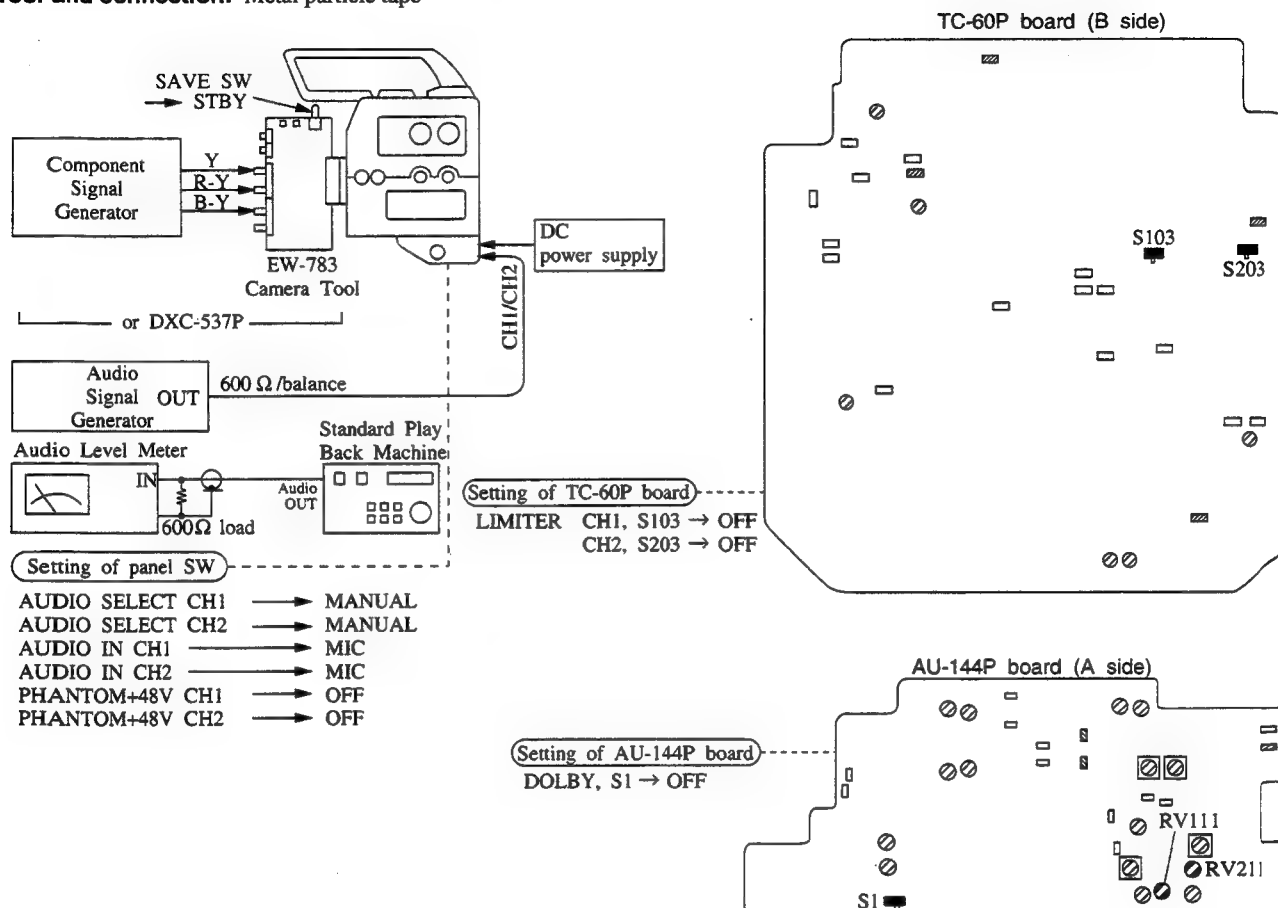
### 3. Bias trap adjustment and Bias level adjustment influence each other, so confirm the specification 1 again.

### 8-8. RECORDING LEVEL ADJUSTMENT

**Equipment required:** Audio level meter

**Tool and connection:** Metal particle tape

**Location:**



**Input Signal:** 1 kHz, -60 dBu

**Mode:** REC → Measuring (Play back with a standard play back machine) → adjustment —

### Adjustments and specifications :

Use a standard play back machine that audio head phase, play back frequency response and play back level are adjusted by an alignment tape.

1. Record 1 kHz, -60 dBu signal.
2. Play back the recorded portion with a standard play back machine (DOLBY OFF), and measure the level.

## Measuring Points

**AUDIO OUT** terminal of a  
standard play back machine(CH-1) ---- ● RV111

**AUDIO OUT** terminal of a  
standard play back machine(CH-2) ---- ● RV211

### Adjustment Points

### Specification

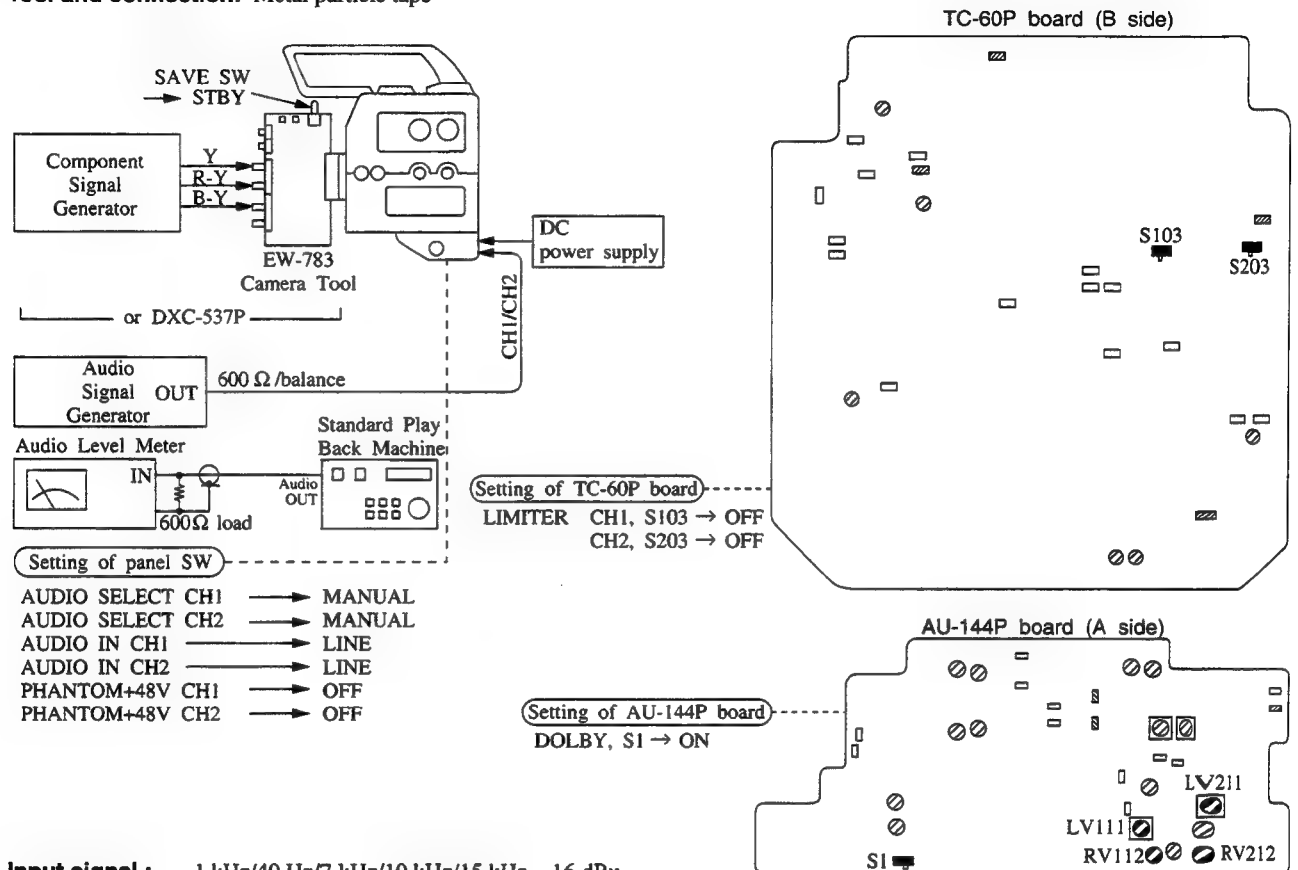
+4.0 ± 0.2 dBm

## 8-9. RECORDING FREQUENCY RESPONSE ADJUSTMENT

**Equipment required:** Audio level meter

**Location:**

**Tool and connection:** Metal particle tape



**Input signal :** 1 kHz/40 Hz/7 kHz/10 kHz/15 kHz, -16 dBu

**Mode:** → REC → Measuring (Play back with a standard play back machine) → adjustment

### Adjustments and specifications :

Use a standard play back machine that audio head phase, play back frequency response and play back level are adjusted by an alignment tape.

1. Record each frequency for about by 10 seconds.
2. Play back the recorded portion with a standard play back machine (DOLBY ON). Measure the level of each frequency referring to the level of 1 kHz.

#### Measuring Points

AUDIO OUT terminal of  
standard play back machine (CH-1)

#### Adjustment Points

- |        |          |       |
|--------|----------|-------|
| (CH-1) | 10 kHz → | RV112 |
|        | 15 kHz → | LV111 |
| (CH-2) | 10 kHz → | RV212 |
|        | 15 kHz → | LV211 |

#### Specifications

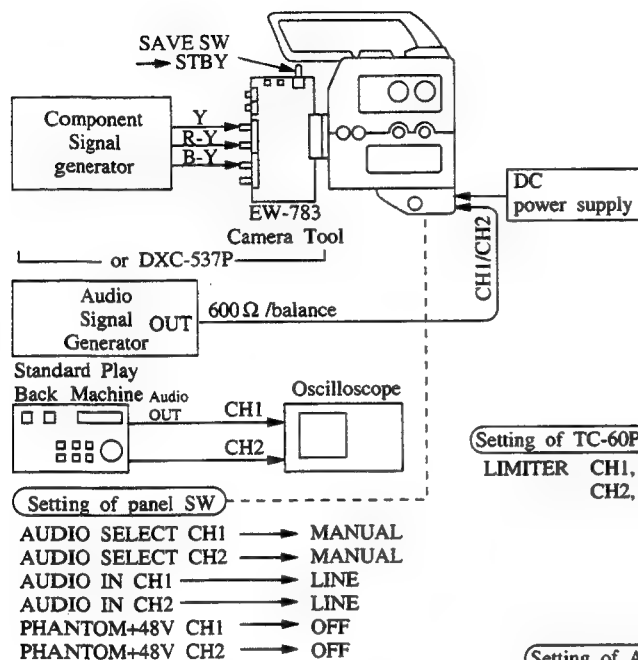
Frequency(Hz)	Level(dB)
1 k	reference
40	reference +1 -3
7 k	reference ±1
10 k	reference +1 -1.5
15 k	reference +1 -2.5

## 8-10. CHANNEL RECORDING PHASE ADJUSTMENT

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

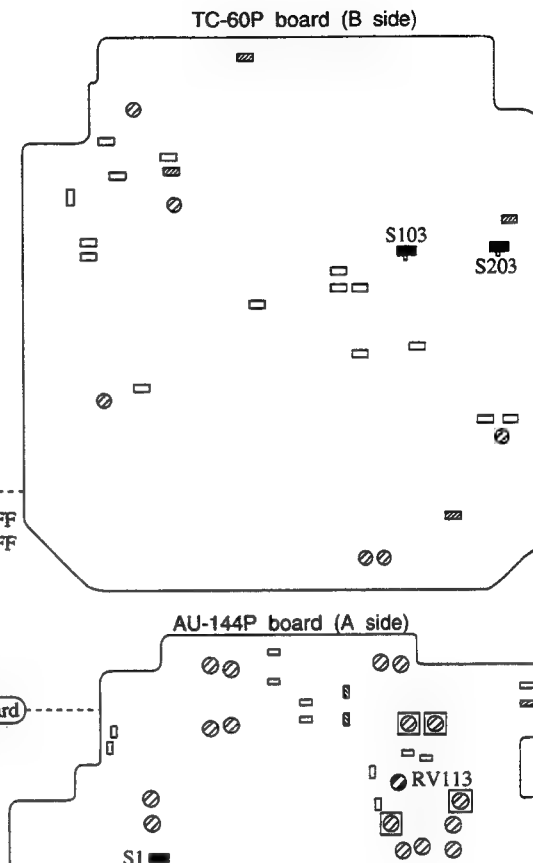
**Location:**



Setting of TC-60P board

LIMITER CH1, S103 → OFF

CH2, S203 → OFF



Setting of AU-144P board

DOLBY, S1 → ON

**Input signal:** 15 kHz, +4 dBu

**Mode:** REC → Measuring (Play back with a standard play back machine) → adjustment

### Adjustments and specifications :

Use a standard play back machine that audio head phase, play back frequency response and play back level are adjusted by an alignment tape.

1. Input 15 kHz +4 dBu signal at CH-1/CH-2 connectors simultaneously, and record it.
2. Play back the recorded portion with a standard play back machine (DOLBY ON). Measure the phase difference.

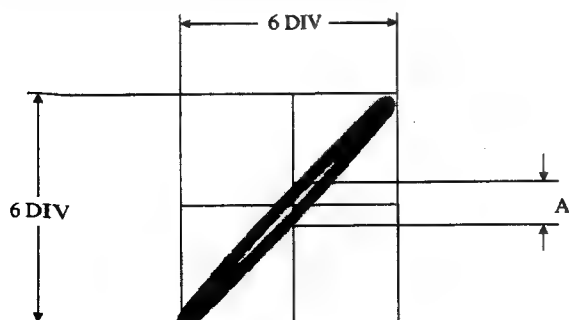
**Measuring Points**

AUDIO OUT terminals of a standard play back machine (CH-1/CH-2)

Oscilloscope (XY mode) lissajous waveform

**Adjustment point**

RV113



**Specifications**

A = 1 div

(phase difference is less than 10°)

## SECTION 9

### VIDEO SYSTEM ALIGNMENT

#### Equipment Required

- Oscilloscope (Tektronix 2445/100MHz or equivalent)
- Current probe
- Spectrum analyzer
- Waveform/vector monitor (Tektronix 1751 or equivalent)
- Component waveform monitor (Tektronix WFM 300 or equivalent)
- Sweep generator (Tektronix TSG130 MODEL 03/leader 425: BETACAM SP Spec.)
- Deviation checker EW-579 (J-6335-790-A)
- If you have spectrum analyzer, deviation checker is not necessary.
- Camera tool EW-783 (J-6337-830-A)
- Standard play back machine
- DC power supply (AC-500CE, CMA-8ACE)
- Alignment tape CR2-1B PS (8-960-096-51)
- CR5-1B PS (8-960-096-91)
- Metal particle tape
- Shorting clip x2

**NOTE:** Standard play back machine is adjusted with play back video phase, play back Y/C delay and play back C/C delay.

#### Alignment tape contents

CR2-1B PS (8-960-096-51)

VIDEO TRACK	AUDIO TRACK	TIME CODE TRACK	CTL TRACK
Y: 4MHz signal C: 5MHz signal	—	CTL	CTL

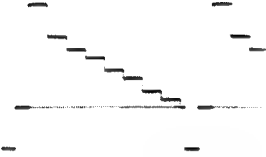
CR5-1B PS (8-960-096-91)

TIME min. sec	VIDEO TRACK	AFM
0:00	RF Sweep	No-Signal
2:00	60% H Sweep (CTDM)	
5:00	Pulse & Bar (CTDM)	
8:00	60% Multi Burst	
11:00	Pulse & Bar	
14:00	100% Color Bars	400 Hz SINE WAVE 25 kHz DEVIATION
16:30		75 kHz DEVIATION
17:00	50% Bowtie & 10T	No-Signal
19:00	Line 17A	
22:00	Quad Phase	
24:00	Flat Field	
26:00	100% Color Bar with Dropout	
28:00	Composite H Sweep with VISC	
30:00		

## Signal waveform for adjustment

- Component signal generator  
100% COLOR BARS

Y



R-Y

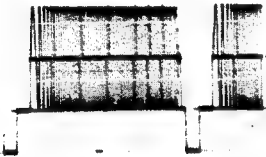


B-Y

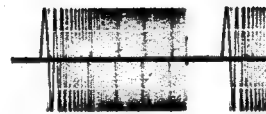


## 100% NALLOW LINE SWEEP

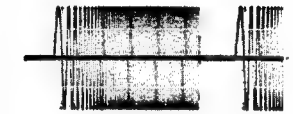
Y



R-Y

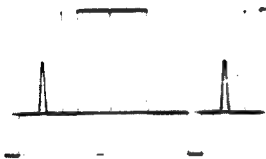


B-Y



## PULSE & BAR (2T)

Y



R-Y

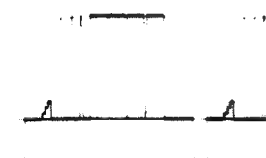


B-Y

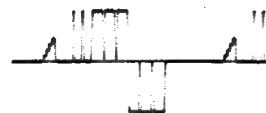


## PULSE & BAR (2, 4T)

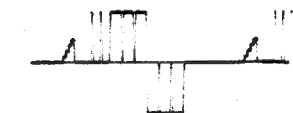
Y



R-Y



B-Y

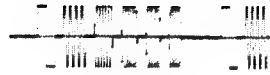
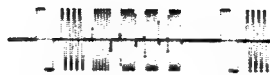
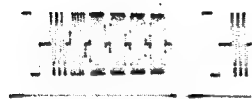


# 60% MULTI BURST

Y

R-Y

B-Y



# BOWTIE

Y

R-Y

B-Y



# 50% FLAT FIELD

Y

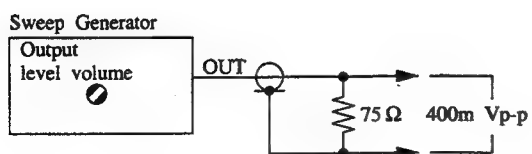
R-Y

B-Y



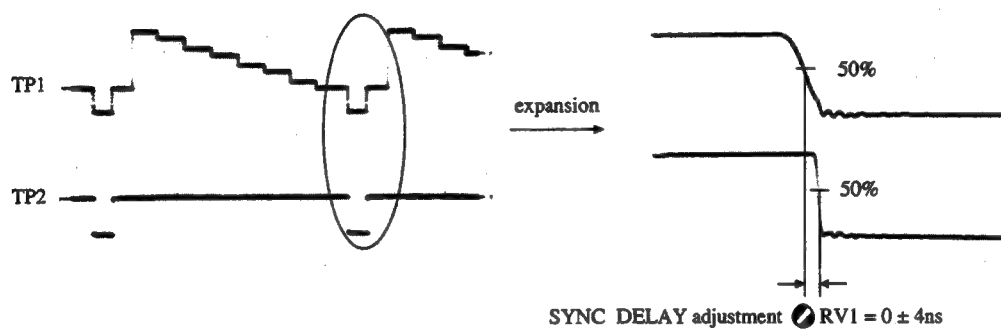
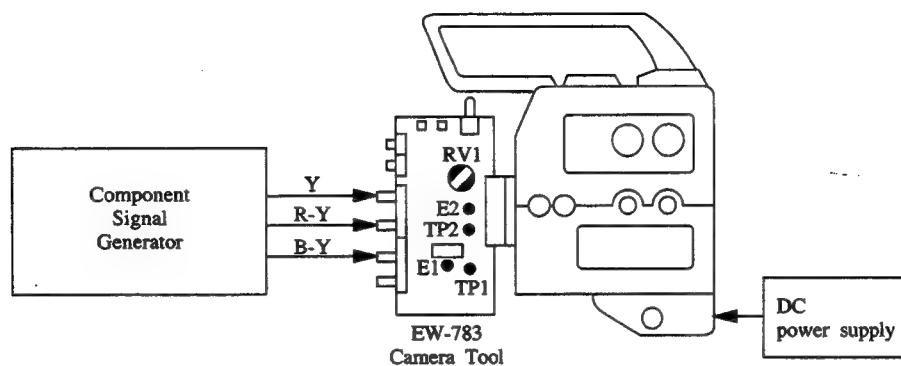
# Output level setting of sweep generator

Adjust  output level volume to 400mVp-p at 75 ohms terminated.



## Adjustment of camera tool

- When using camera tool, perform SYNC DELAY adjustment as follows.





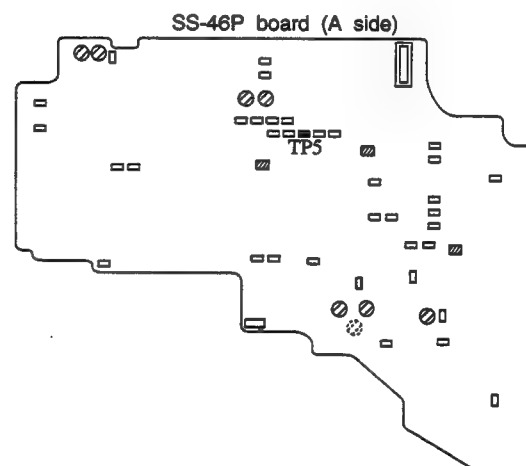
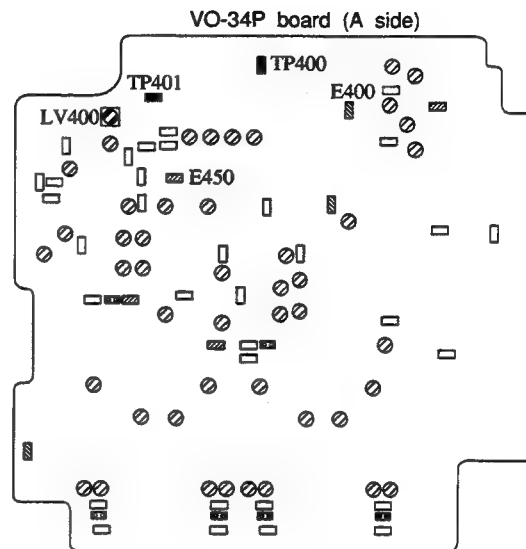
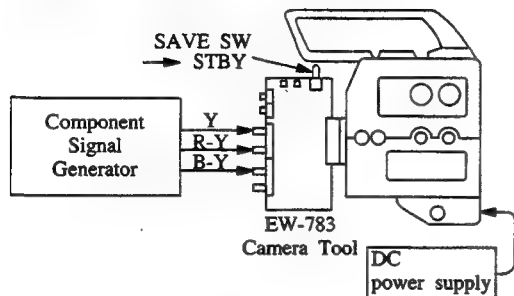
## 9-1. TIMING GENERATOR SYSTEM ADJUSTMENT

### 9-1-1. PLL VCO Error Voltage Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** 100% COLOR BARS

**Mode:** REC mode (metal particle tape)

**Adjustment and specifications:**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

■ TP401

TRIG: ■ TP5 COMP SYNC



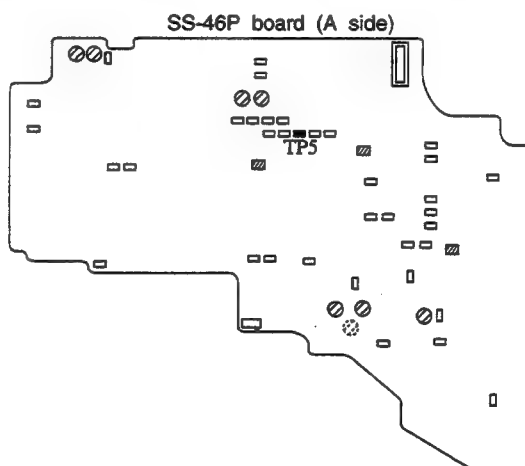
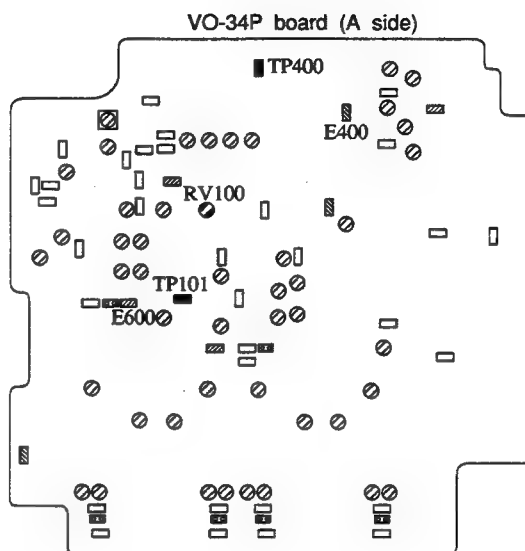
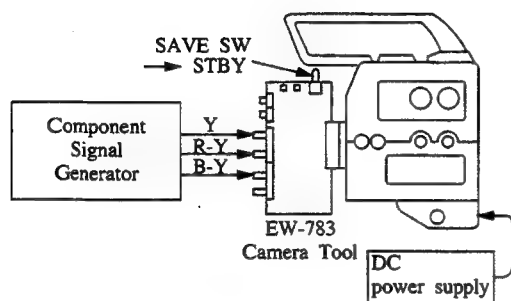
## 9-2. Y RECORDING SYSTEM ADJUSTMENT

### 9-2-1. Y Input Level Adjustment

**Equipment Required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



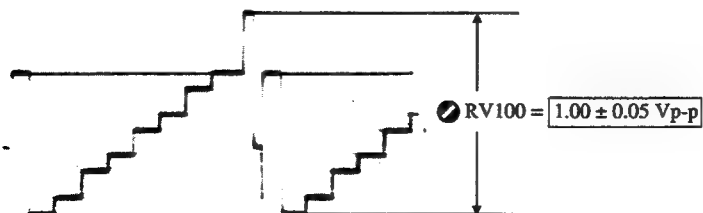
**Input signal:** 100% COLOR BARS

**Mode:** REC mode (metal particle tape)

**Adjustment and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

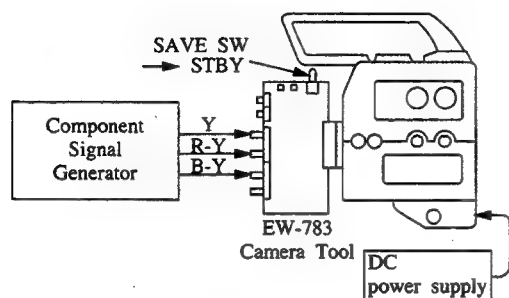
■ TP101 Y      TRIG: ■ TP5 COMP SYNC



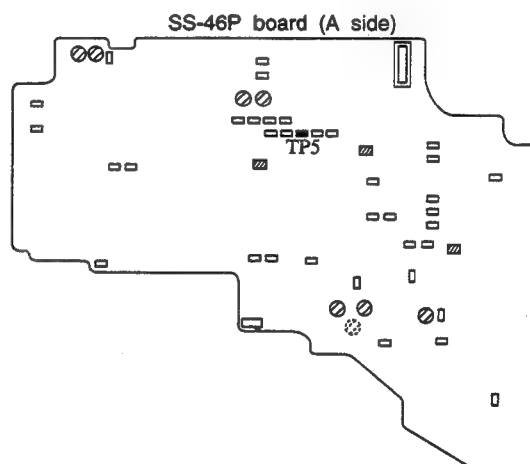
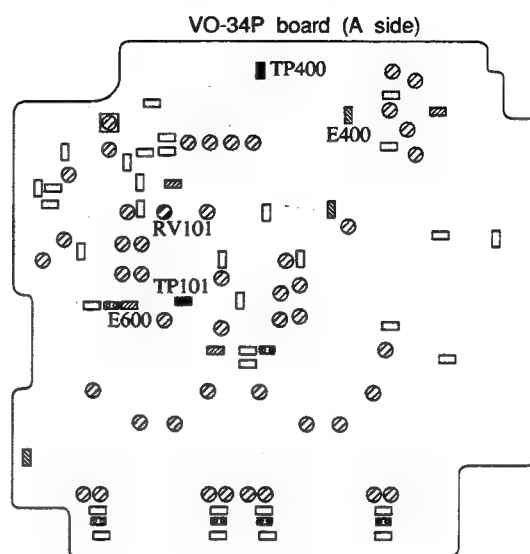
## 9-2-2. Y REF SYNC Level Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape



**Location:**



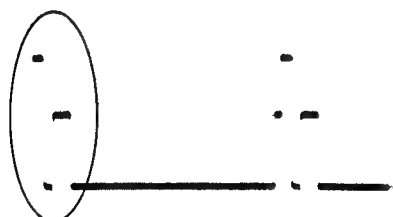
**Input signal:** 50% FLAT FIELD

**Mode:** REC mode (metal particle tape)

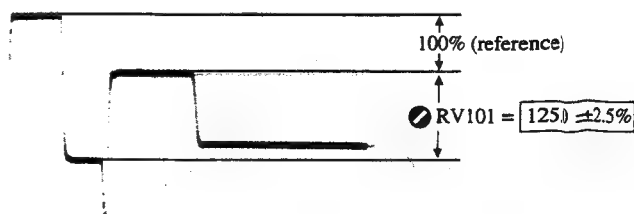
**Adjustment and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP101 Y TRIG: ■ TP5 COMP SYNC



expansion →

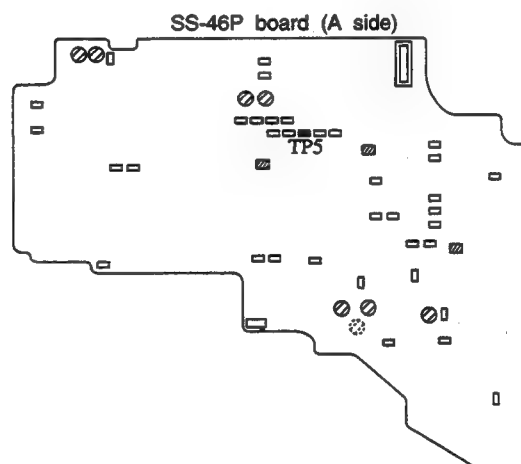
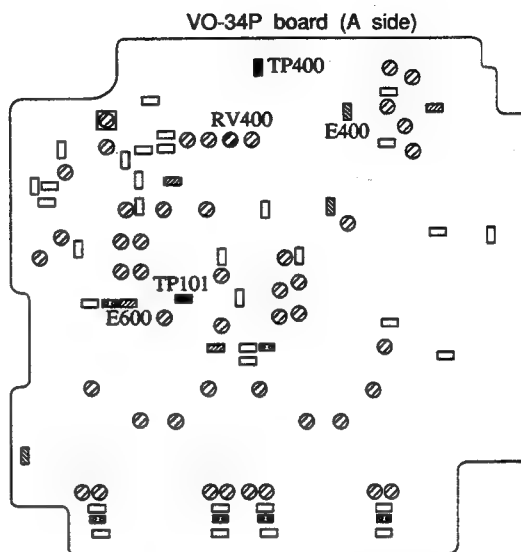
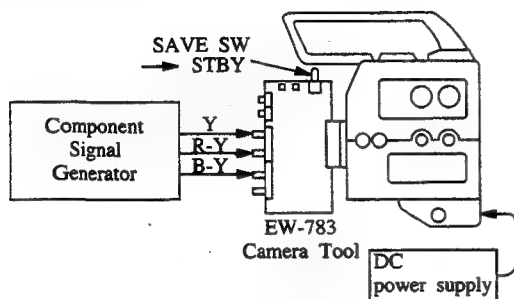


### 9-2-3. Y REF SYNC Position Tentative Adjustment (After this adjustment, perform 9-5-3 Recording Video Phase Adjustment.)

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



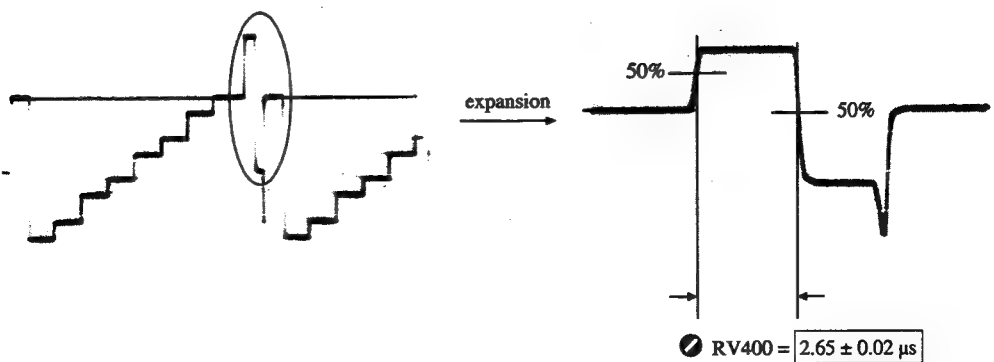
**Input signal:** 100% COLOR BARS

**Mode:** REC mode (metal particle tape)

**Adjustment and specifications:**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

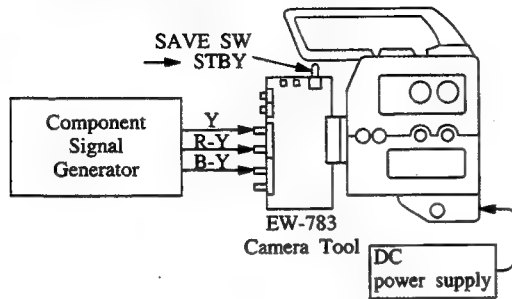
■ TP101 Y      TRIG: ■ TP5 COMP SYNC



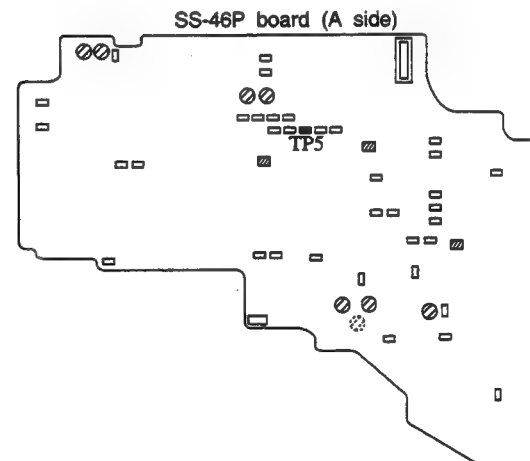
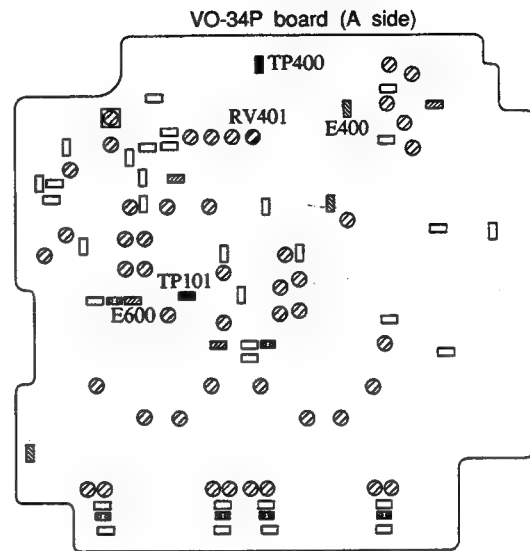
## 9-2-4. Y REF SYNC Pulse Width Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape



**Location:**



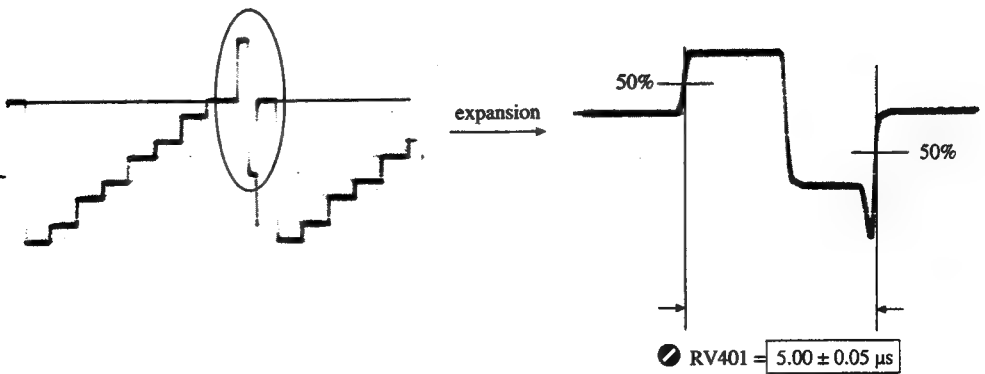
**Input signal:** 100% COLOR BARS

**Mode:** REC mode (metal particle tape)

**Adjustment and specifications:**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

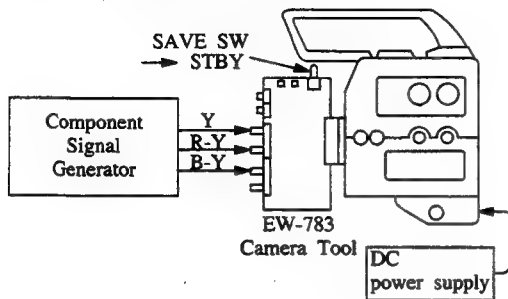
■ TP101 Y      TRIG: ■ TP5 COMP SYNC



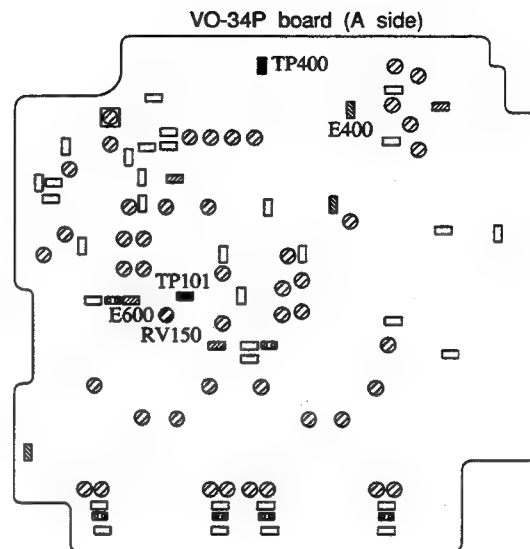
### 9-2-5. SLEW RATE Limiter Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape



**Location:**



**Input signal:** 100% NALLOW LINE SWEEP

**Mode:** REC mode (metal particle tape)

**Adjustment and specifications:**

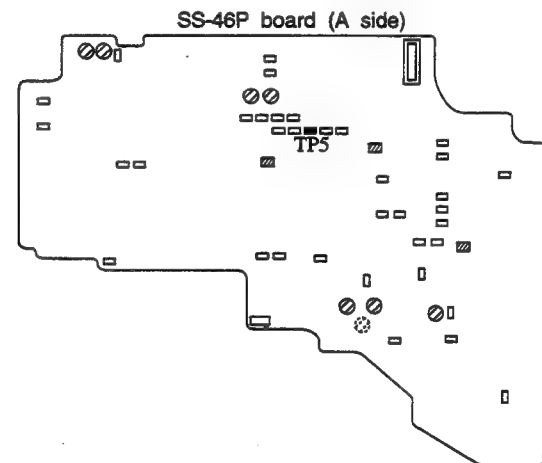
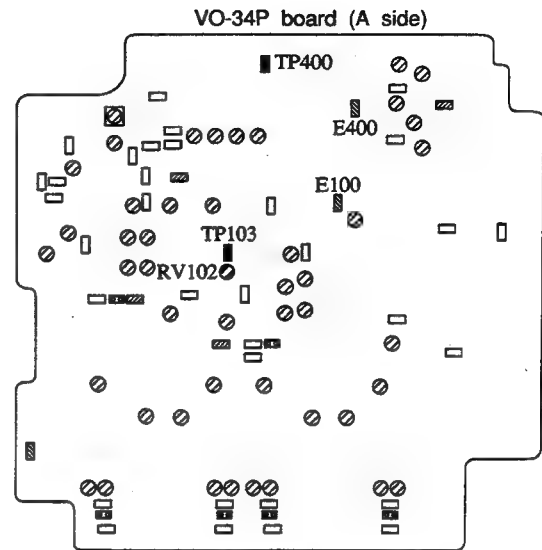
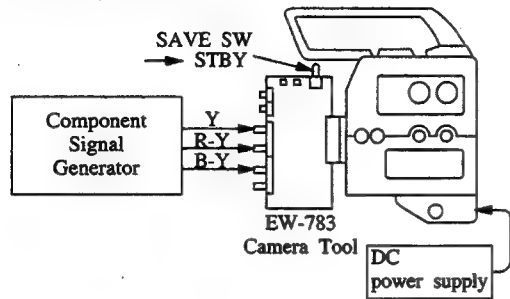
Turn ● RV150 fully counterclockwise.

## 9-2-6. Y Nonlinear Pre-emphasis Level Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** PULSE & BAR (2, 4T)

**Mode:** REC mode (metal particle tape)

**Adjustment and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP103

TRIG: ■ TP5 COMP SYNC

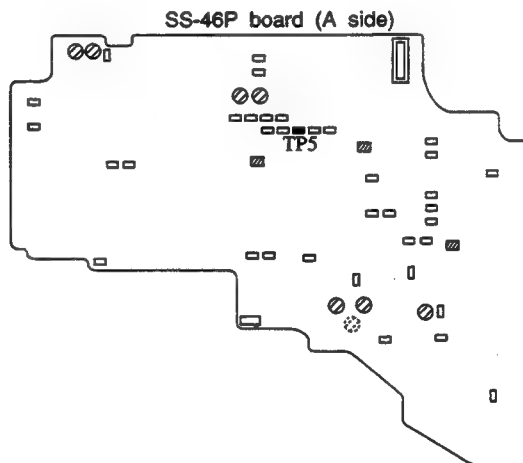
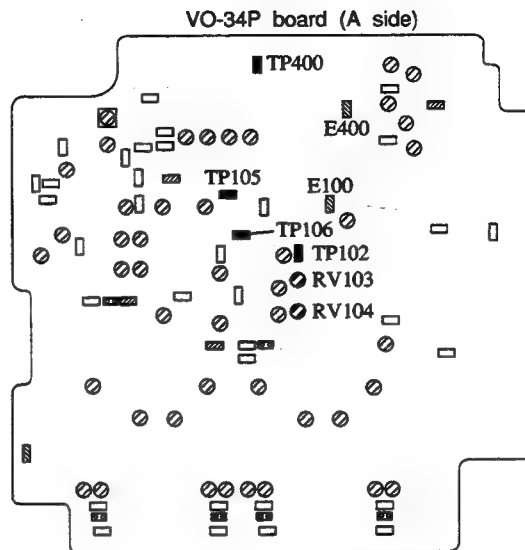
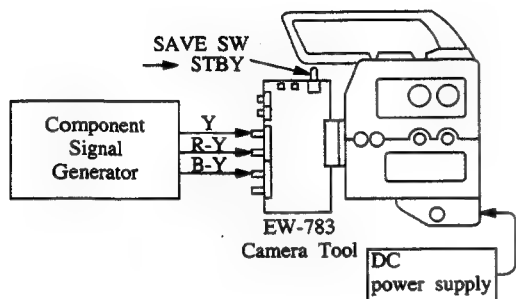


## 9-2-7. Y White Clip/Dark Clip Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape  
Capacitor 680 PF

**Location:**



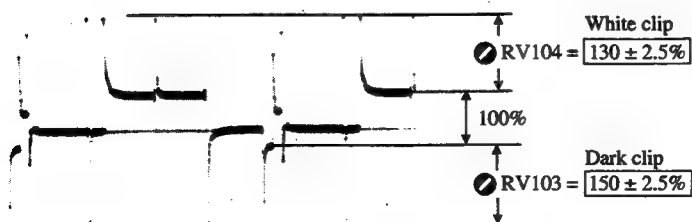
**Input signal:** PULSE & BAR (2, 4T)  
**Mode:** REC mode (metal particle tape)

**Adjustment and specifications:**

1. Connecting capacitor 680 PF between ■ TP105 and ■ TP106.
2. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP102

TRIG: ■ TP5 COMP SYNC



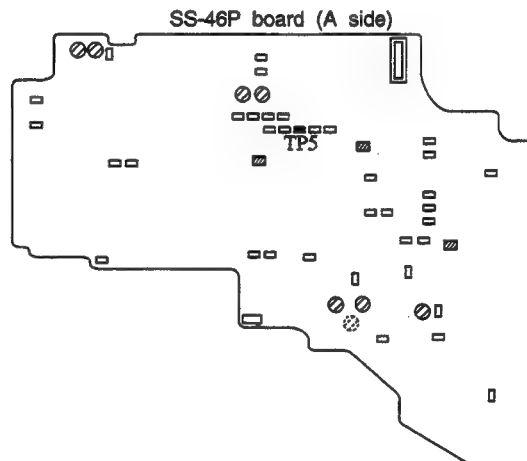
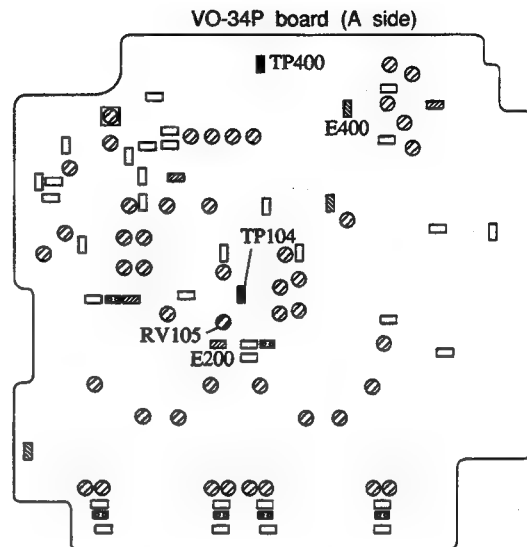
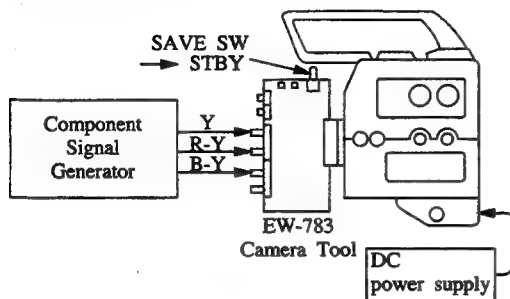
3. After adjustment, remove the capacitor 680 PF.



## 9-2-8. Y REC HF Adjustment

**Equipment required:** Oscilloscope  
**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** 100% NALLOW LINE SWEEP  
**Mode:** REC mode (metal particle tape)  
**Adjustment and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP104      TRIG: ■ TP5 COMP SYNC

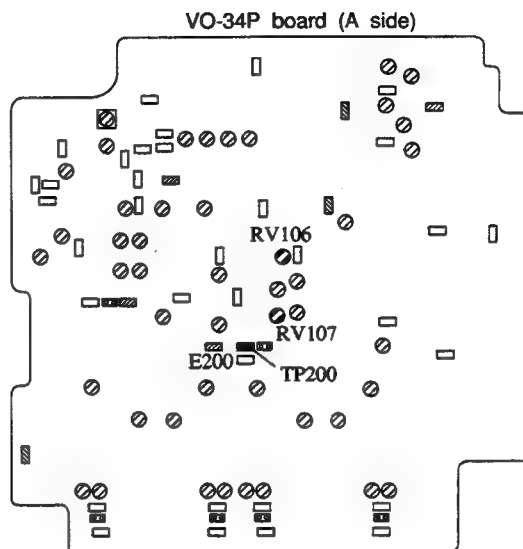
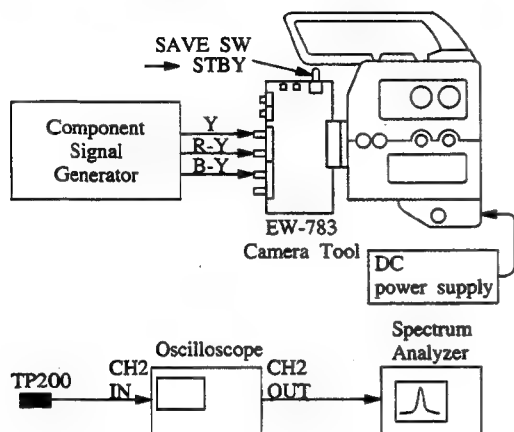


## 9-2-9. Y Carrier Set / Deviation Adjustment - - - a) Using a Spectrum analyzer

**Equipment required:** Spectrum analyzer, Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** 100% FLAT FIELD

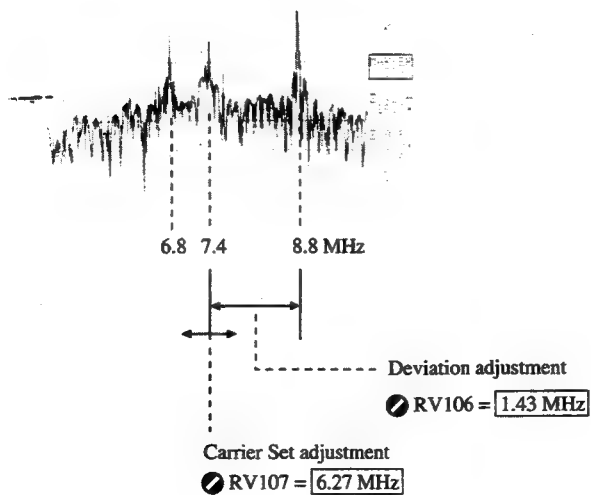
**Mode:** REC mode (metal particle tape)

**Adjustment and Specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP200

Spectrum analyzer waveform

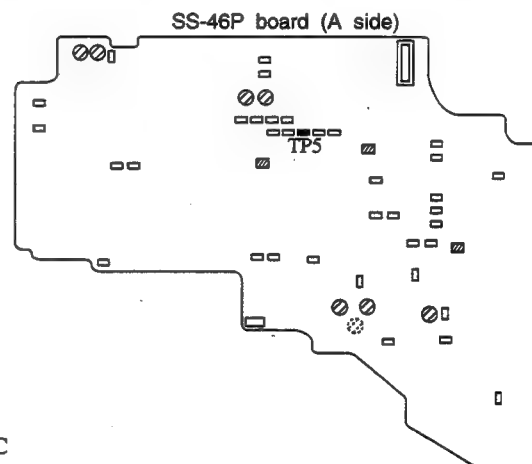
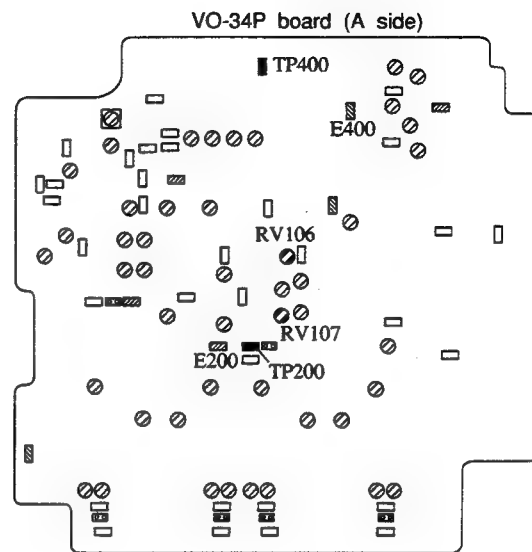
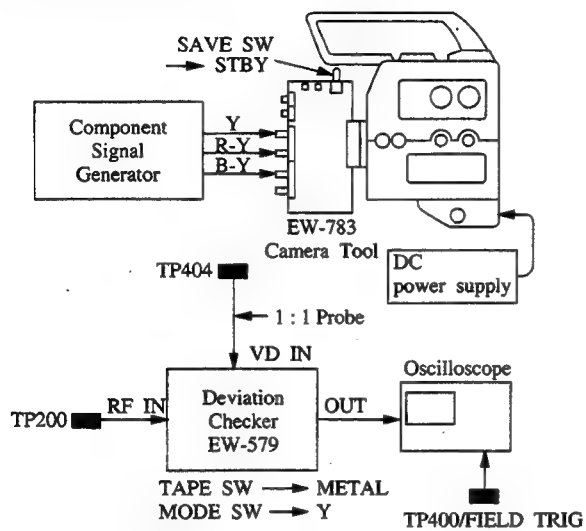


## Y Carrier Set / Deviation Adjustment --- b) Using a Deviation checker

**Equipment required:** Deviation checker, Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**

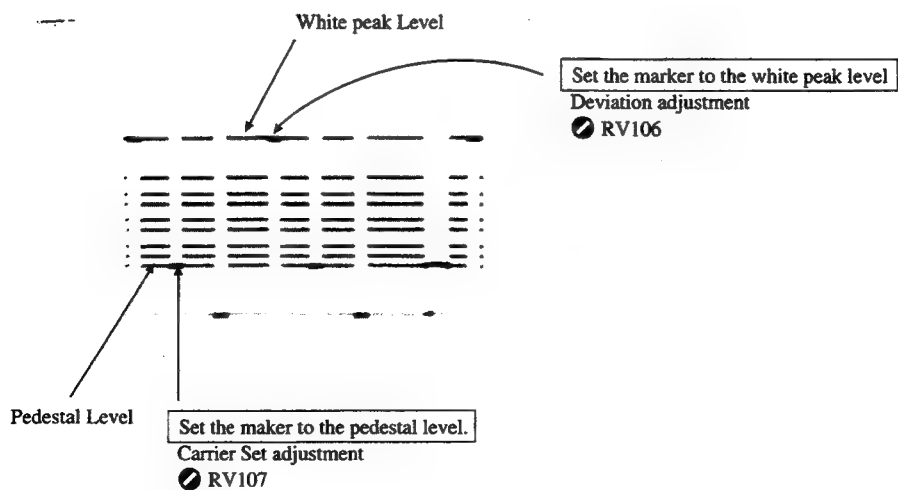


**Input signal:** 100% COLOR BARS  
**Mode :** REC mode (metal particle tape)

**Adjustment and specifications :**

1. Press the **(VTR S/S SW)** button on the camera tool to put the unit into REC mode, and adjust.

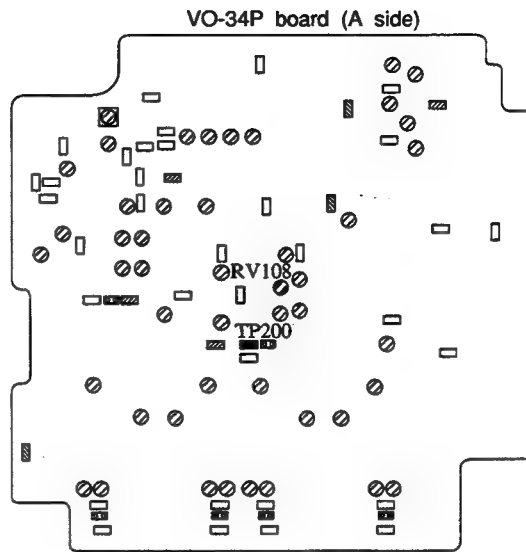
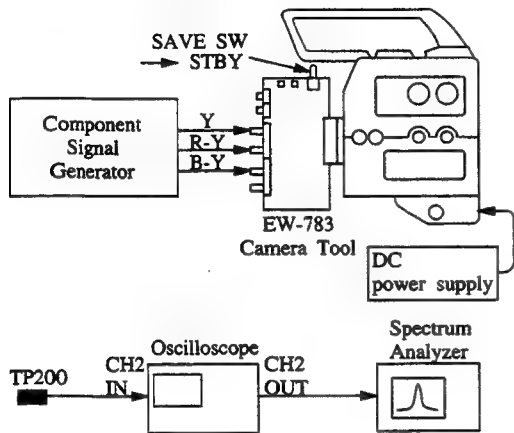
■ TP200      TRIG: ■ TP5 COMP SYNC



## 9-2-10. Y Carrier Balance Adjustment

**Equipment required:** Spectrum analyzer, Oscilloscope  
**Tool and connection:** Metal particle tape

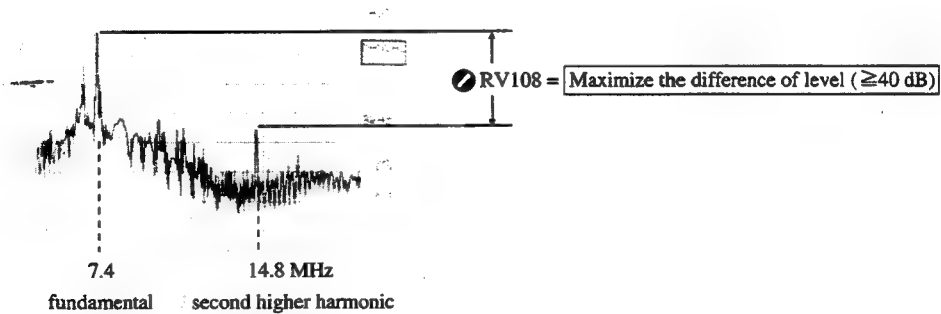
**Location:**



**Input signal:** 50% FLAT FIELD  
**Mode:** REC mode (metal particle tape)  
**Adjustment and specifications:**

1. Press the **(VTR S/S SW)** button on the camera tool to put the unit into REC mode, and adjust.

■ TP200      Spectrum analyzer waveform

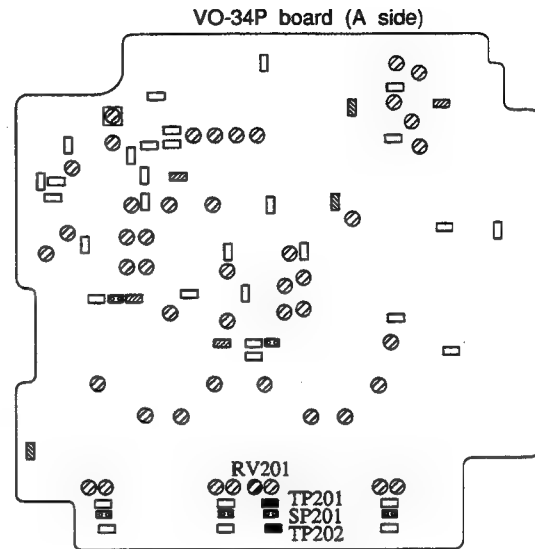
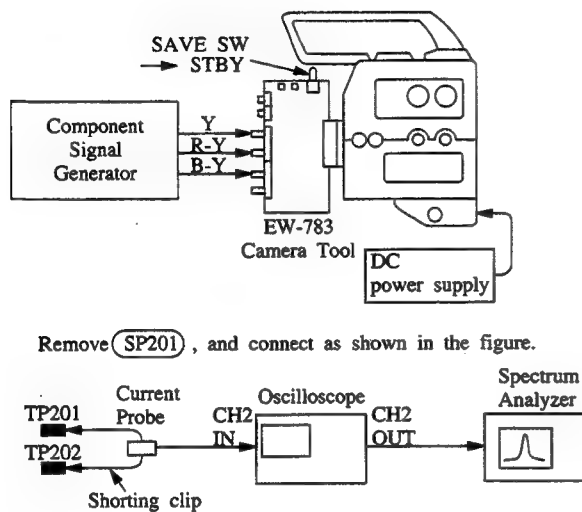


## 9-2-11. Y A-CH Recording Current Secondary Distortion Adjustment

**Equipment required:** Spectrum analyzer, Oscilloscope  
(Current probe)

**Location:**

**Tool and connection:** Shorting clip x1  
Metal particle tape



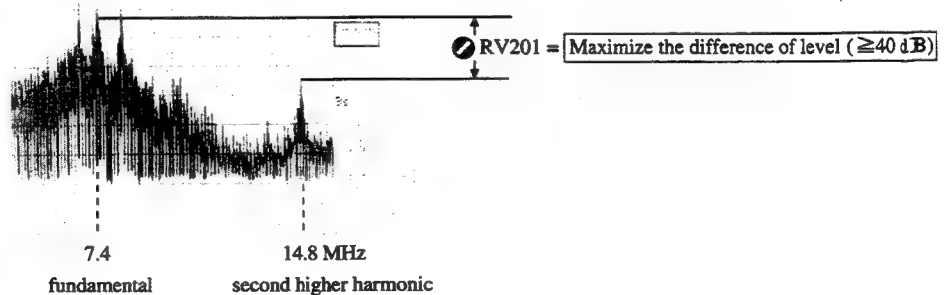
**Input signal:** 50% FLAT FIELD

**Mode:** REC mode (metal particle tape)

**Adjustment and specifications:**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

Spectrum analyzer waveform

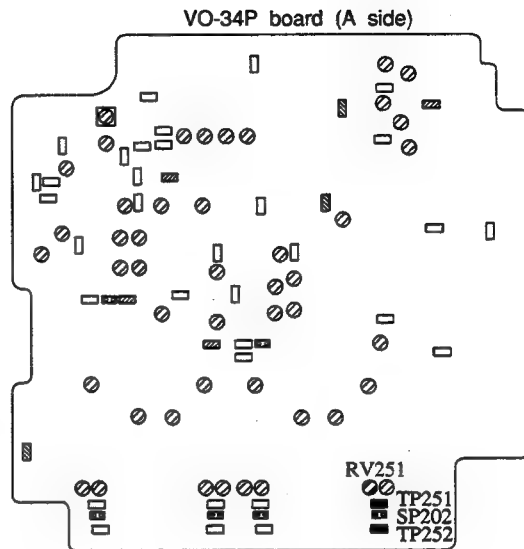
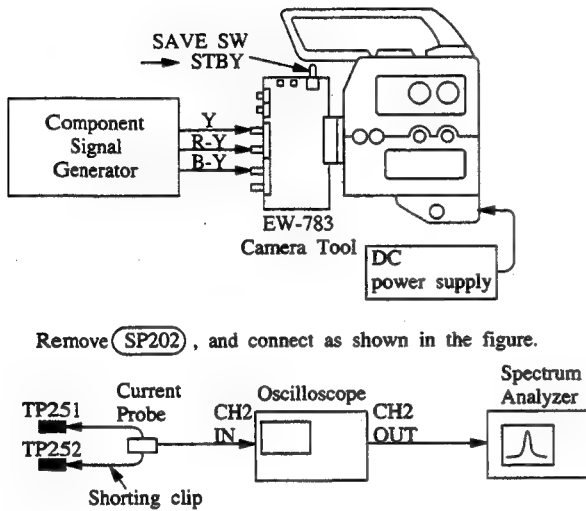


## 9-2-12. Y B-CH Recording Current Secondary Distortion Adjustment

**Equipment required:** Spectrum analyzer, Oscilloscope  
(Current probe)

**Location:**

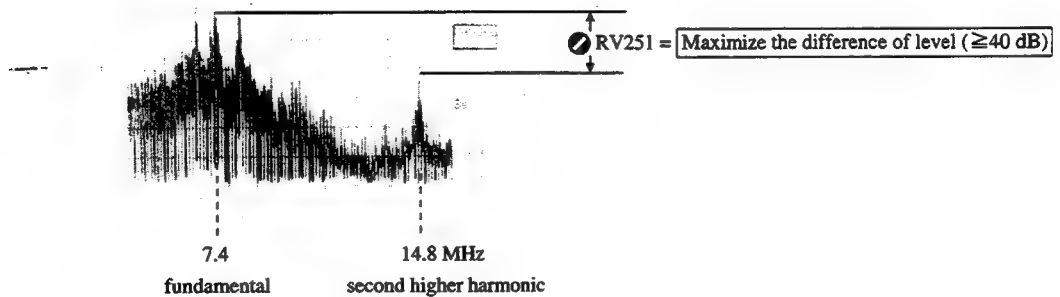
**Tool and connection:** Shorting clip x1  
Metal particle tape



**Input signal:** 50% FLAT FIELD  
**Mode:** REC mode (metal particle tape)  
**Adjustment and specifications :**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

Spectrum analyzer waveform

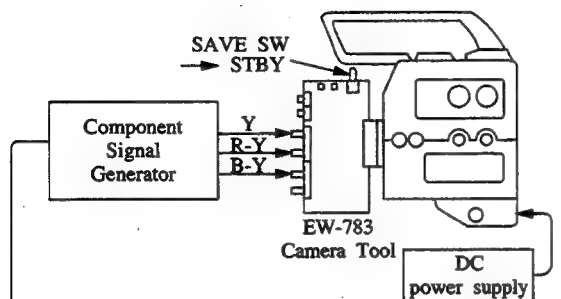


### 9-2-13. Y A-CH Recording Current Frequency Response / Recording Current Level Adjustment

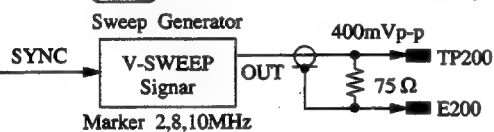
**Equipment required:** Oscilloscope (Current probe)

**Tool and connection:** Sweep generator  
Shorting clip x1  
Metal particle tape

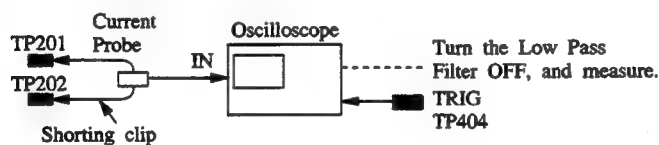
**Location:**



Remove (SP200), and connect as shown in the figure.



Remove (SP201), and connect as shown in the figure.



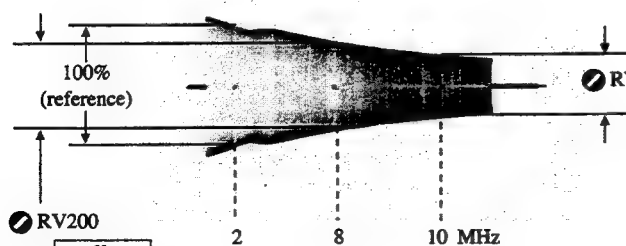
**Input signal:** V-SWEEP signal (400mVp-p)

**Mode:** REC mode (metal particle tape)

**Adjustment and specifications :**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

Oscilloscope TRIG: ■ TP404 SW PULSE



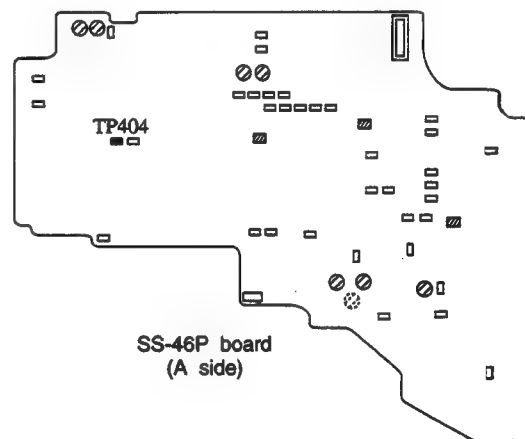
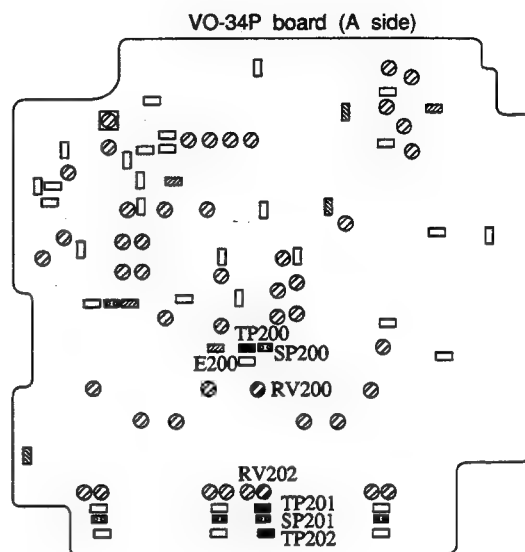
$$\begin{aligned} \text{RV200} &= 35^{+20}_{-10} \text{ mA (PVV-1P)} \\ &= 45^{+10}_{-10} \text{ mA (PVV-1AP)} \end{aligned}$$

(Recording current level adjustment)

$$\text{RV202} = 55^{+10}_{-10} \% \text{ (PVV-1P)}$$

$$60^{+10}_{-10} \% \text{ (PVV-1AP)}$$

(Recording current frequency response adjustment)



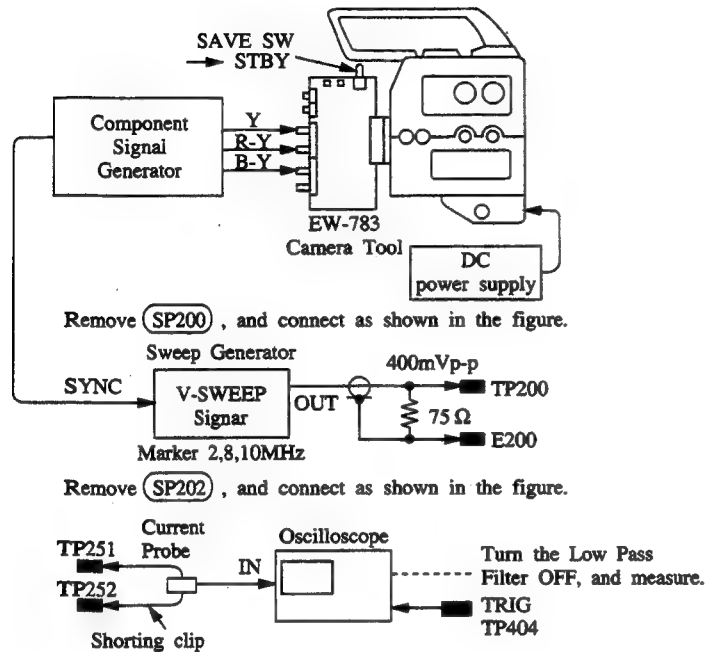
**NOTE:** Adjust the RV202 and RV200 alternately to satisfy the specifications.

## 9-2-14. Y B-CH Recording Current Frequency Response / Recording Current Level Adjustment

**Equipment required:** Oscilloscope (Current probe)

**Tool and connection:** Sweep generator  
Shorting clip x1  
Metal particle tape

**Location:**



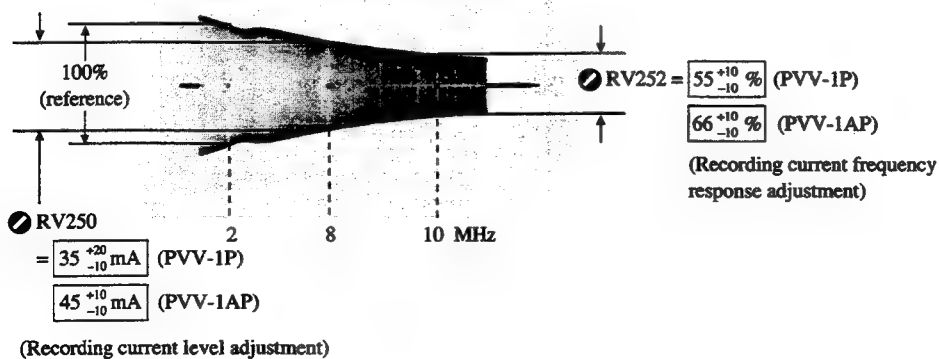
**Input signal:** V-SWEEP signal (400mVp-p)

**Mode:** REC mode (metal particle tape)

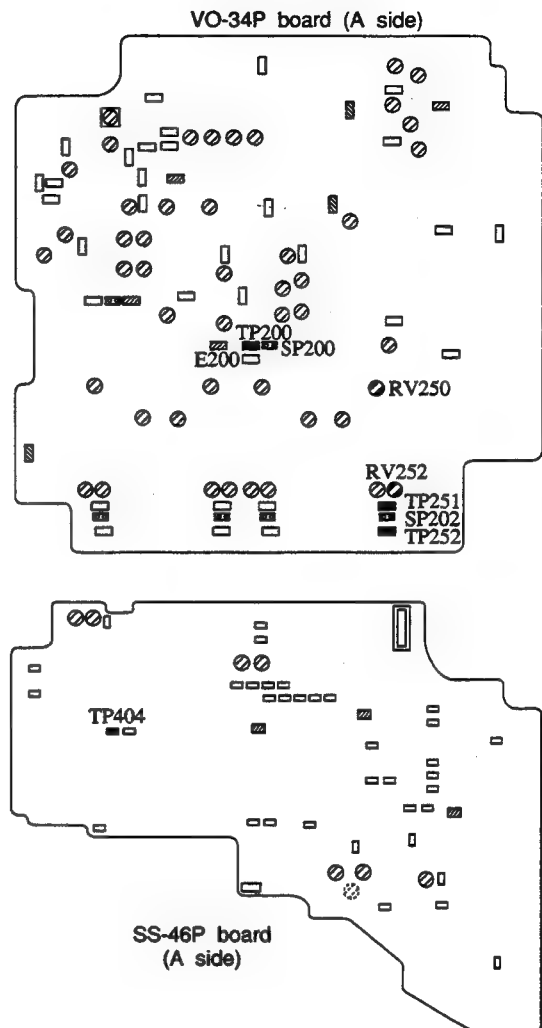
**Adjustment and specifications:**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

Oscilloscope TRIG: ■ TP404 SW PULSE



**NOTE:** Adjust RV252 and RV250 alternately to satisfy the specifications.





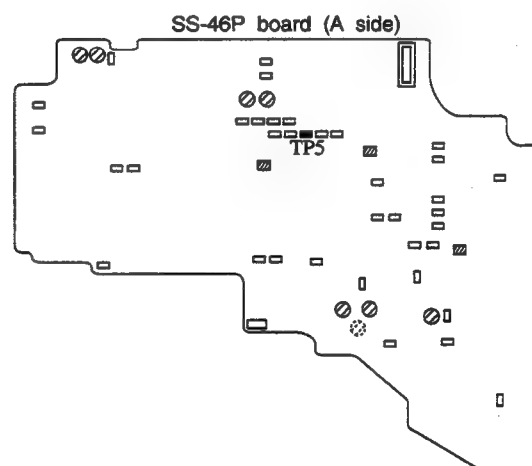
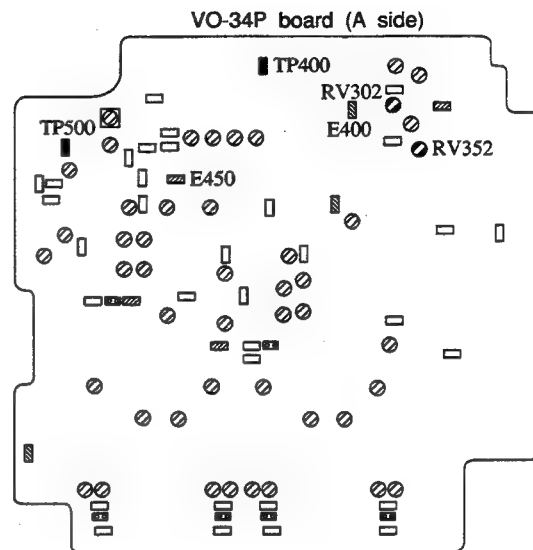
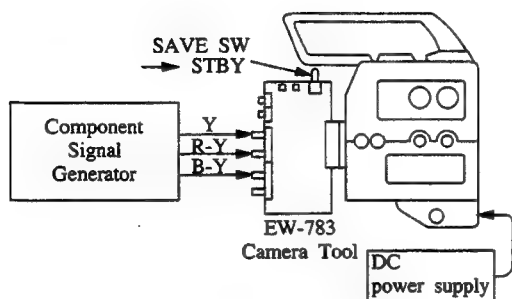
### 9-3. C RECORDING SYSTEM ALIGNMENT

#### 9-3-1. R-Y, B-Y A/D Clump Voltage Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** 100% COLOR BARS

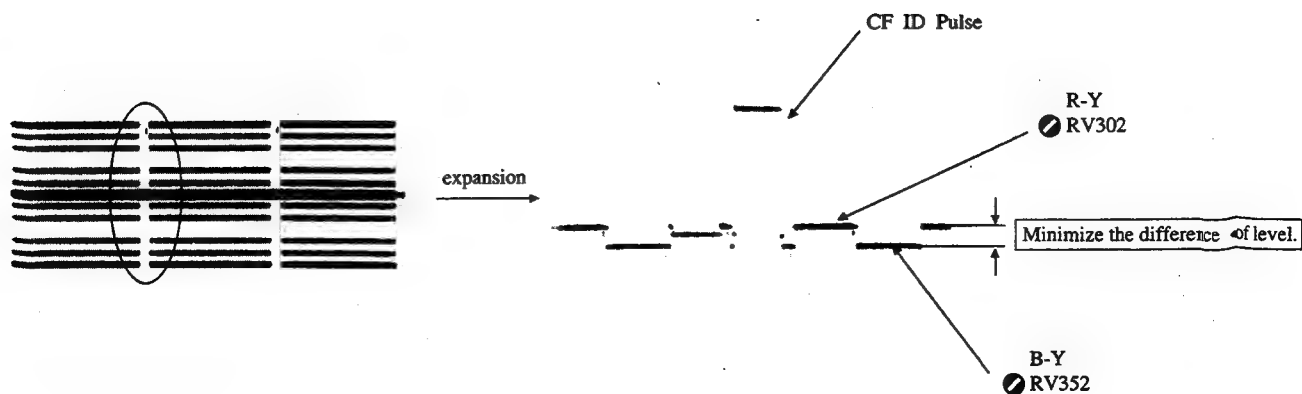
**Mode:** REC mode (metal particle tape)

**Adjustments and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP500 CTDM

TRIG: ■ TP5 COMP SYNC/FIELD TRIG

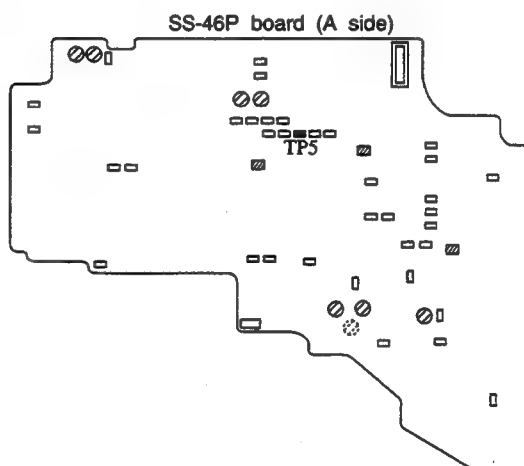
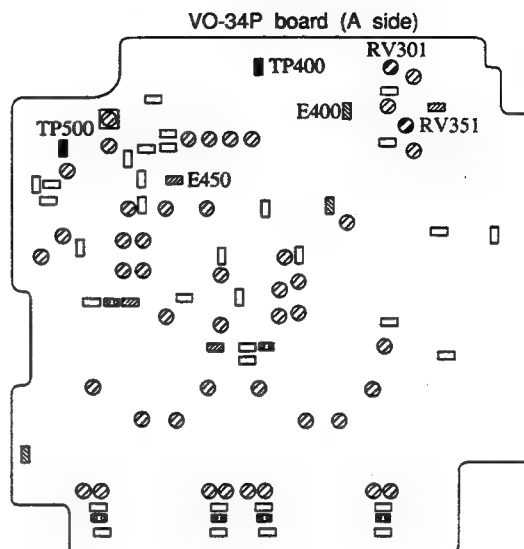
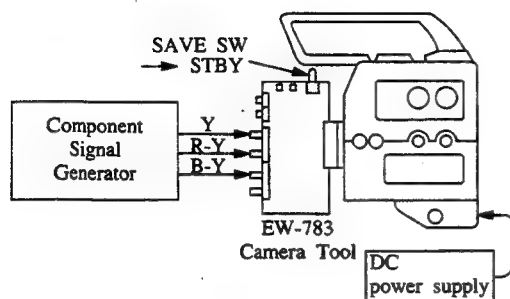


### 9-3-2. R-Y, B-Y A/D Input Level Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** 100% COLOR BARS

**Mode:** REC mode (metal particle tape)

**Adjustments and specifications:**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

■ TP500 CTDM

TRIG: ■ TP5 COMP SYNC

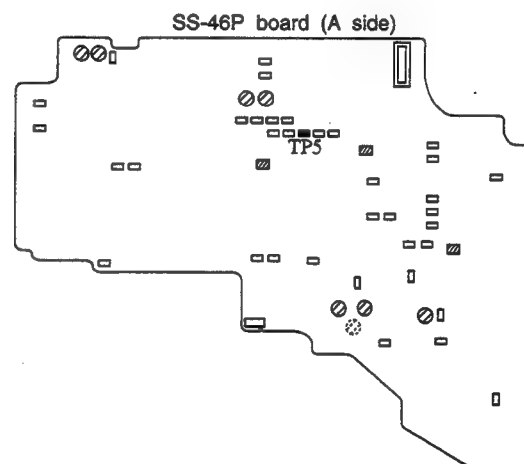
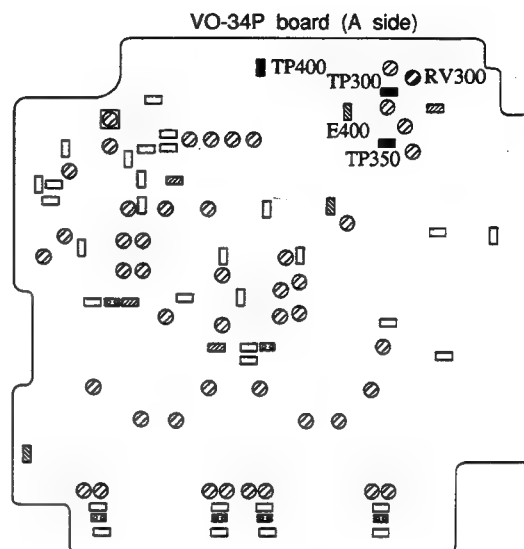
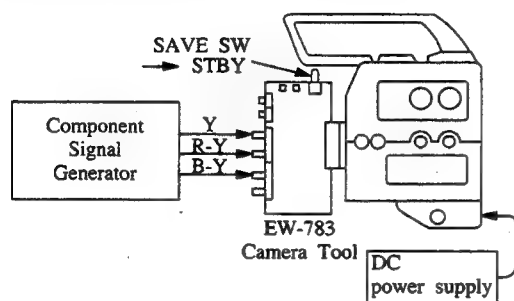


### 9-3-3. C/C Delay Tentative Adjustment (After this adjustment, perform section 9-5-4 Recording C/C Delay Adjustment.)

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** 100% COLOR BARS

**Mode:** REC mode (metal particle tape)

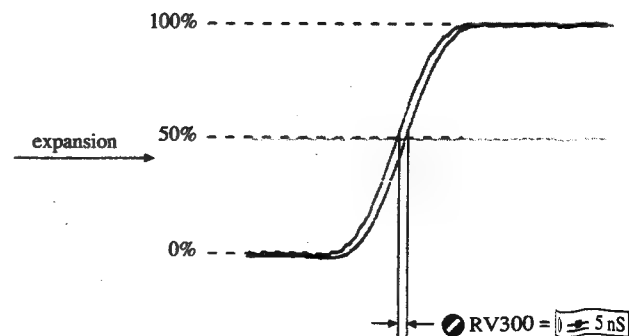
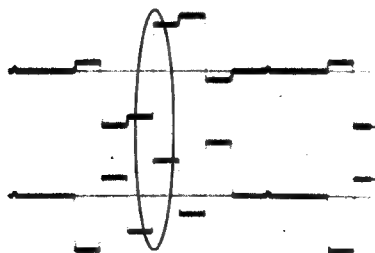
**Adjustments and specifications :**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

TRIG: ■ TP5 COMP SYNC

■ TP300  
R-Y

■ TP350  
B-Y

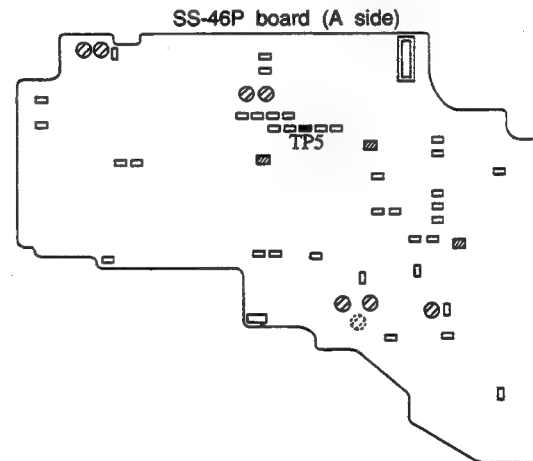
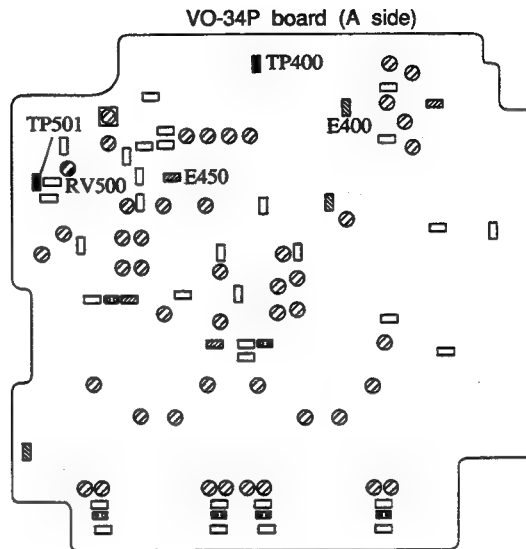
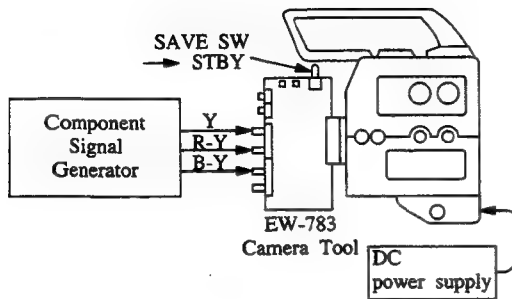


#### 9-3-4. CTDM Level Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** 100% COLOR BARS

**Mode:** REC mode (metal particle tape)

**Adjustments and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP501 CTDM

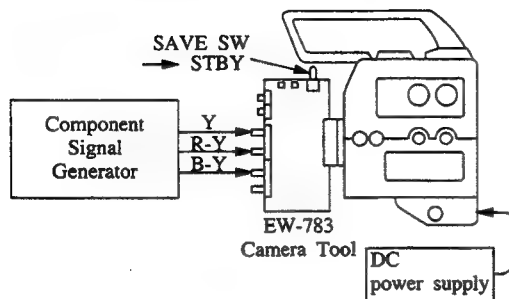
TRIG: ■ TP5 COMP SYNC



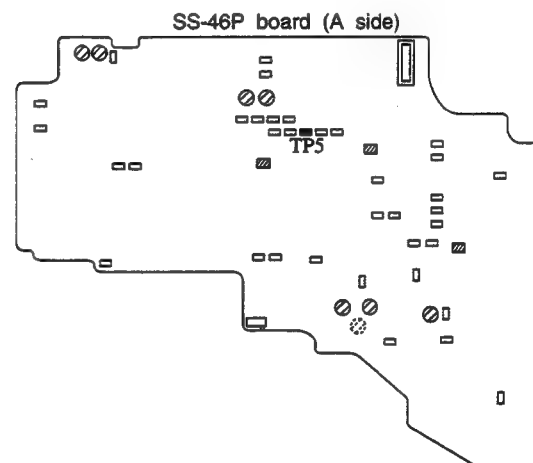
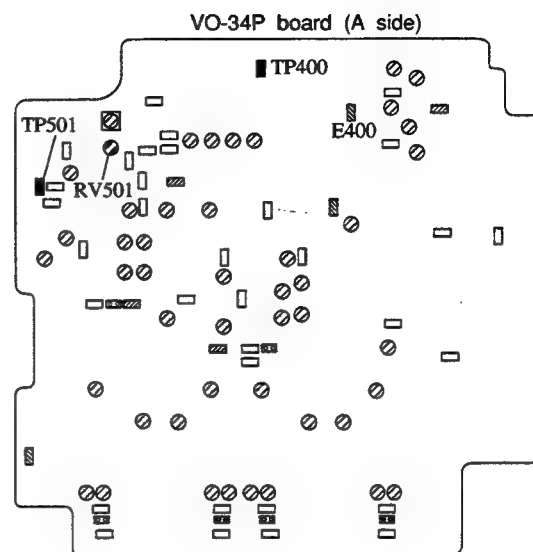
### 9-3-5. C REF SYNC Level Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape



**Location:**



**Input signal:** 100% COLOR BARS

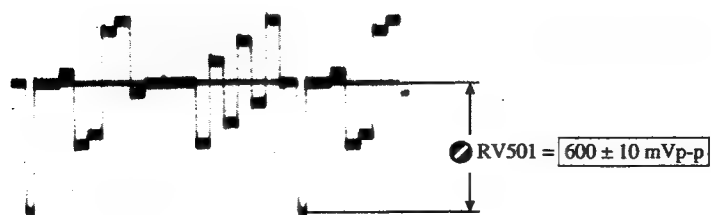
**Mode:** REC mode (metal particle tape)

**Adjustments and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP501 CTDM

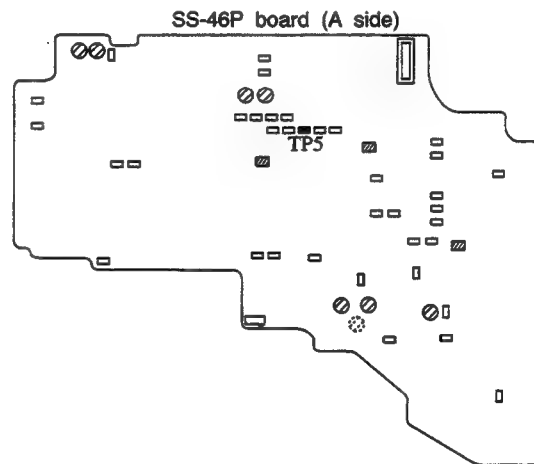
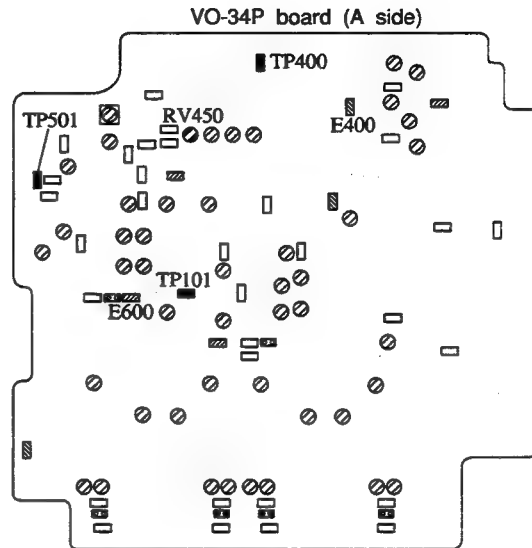
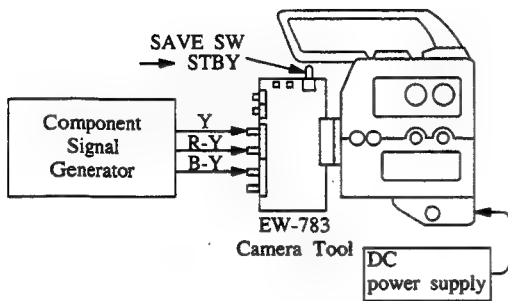
TRIG: ■ TP5 COMP SYNC



### 9-3-6. C REF SYNC Position Tentative Adjustment (After this adjustment, perform section 9-5-4 Recording Y/C Delay Adjustment)

**Equipment required:** Oscilloscope  
**Tool and connection:** Metal particle tape

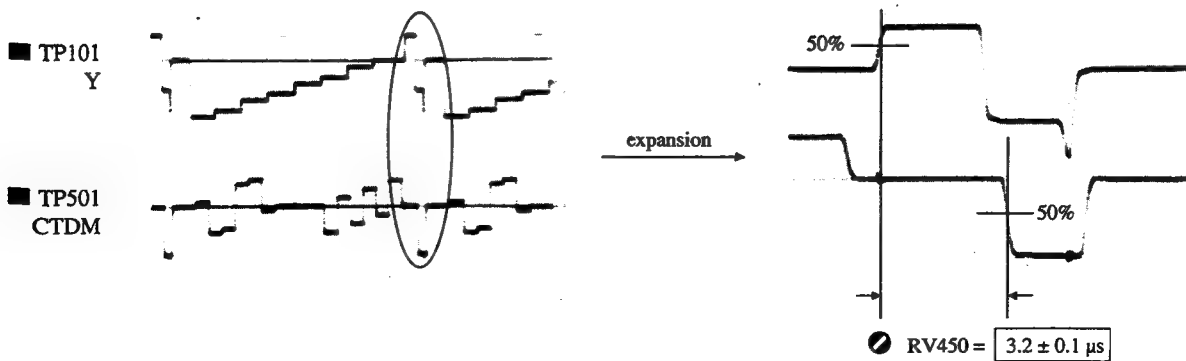
**Location:**



**Input signal:** 100% COLOR BARS  
**Mode:** REC mode (metal particle tape)  
**Adjustments and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

TRIG: ■ TP5 COMP SYNC

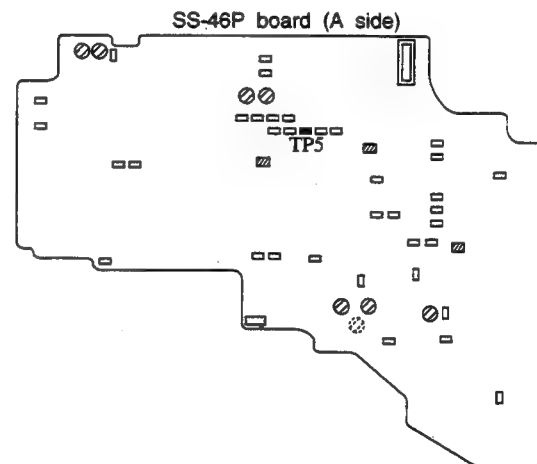
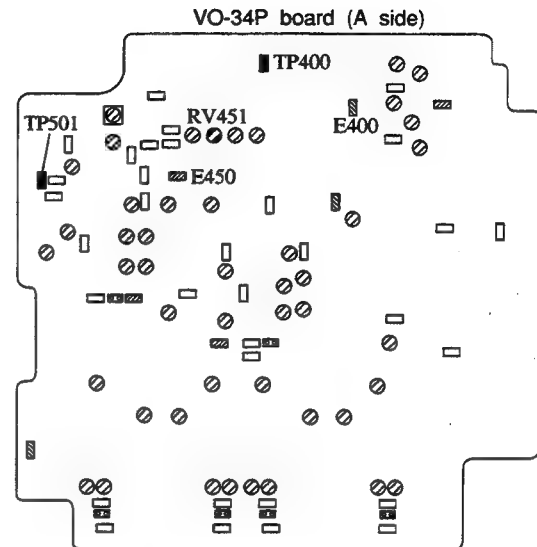
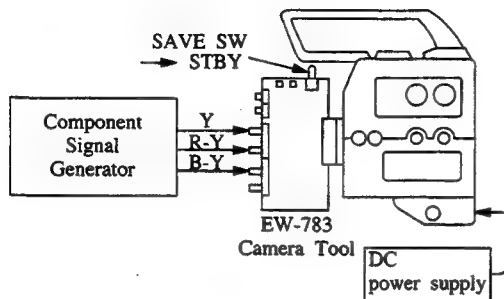


### 9-3-7. C REF SYNC Pulse Width Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** 100% COLOR BARS

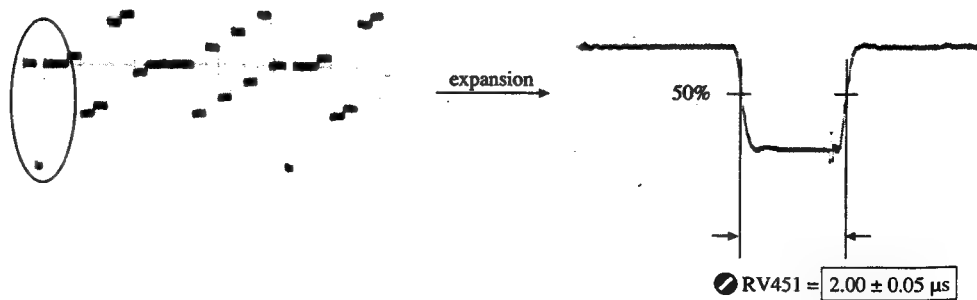
**Mode:** REC mode (metal particle tape)

**Adjustments and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP501 CTDM

TRIG: ■ TP5 COMP SYNC

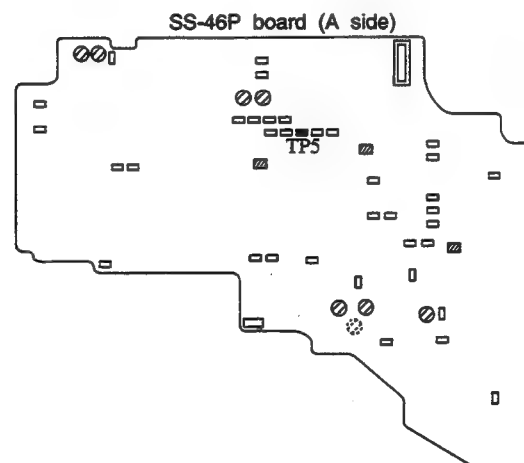
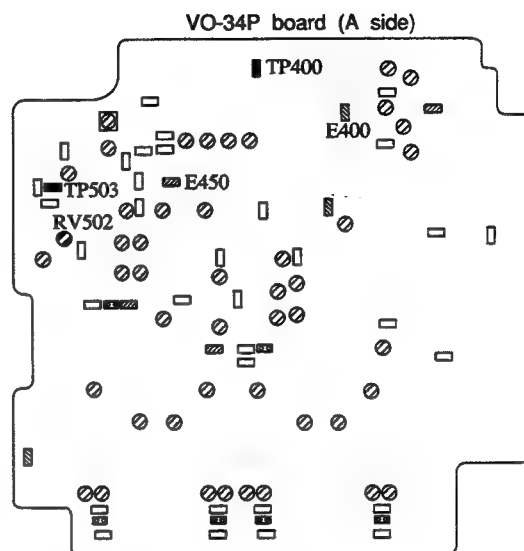
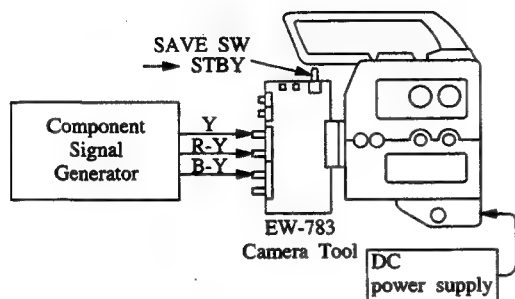


### 9-3-8. C Nonlinear Pre-emphasis Mix Level Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** PULSE & BAR (2, 4T)

**Mode:** REC mode (metal particle tape)

**Adjustments and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP503

TRIG: ■ TP5 COMP SYNC

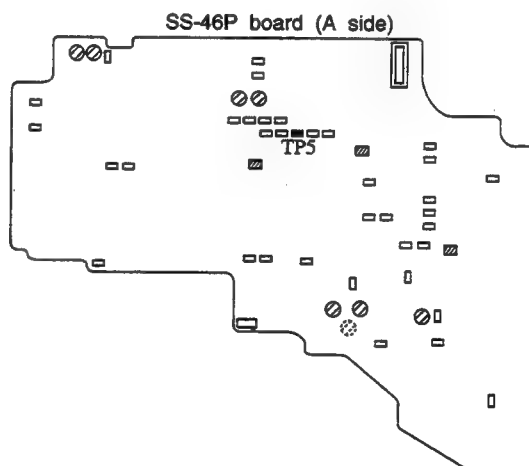
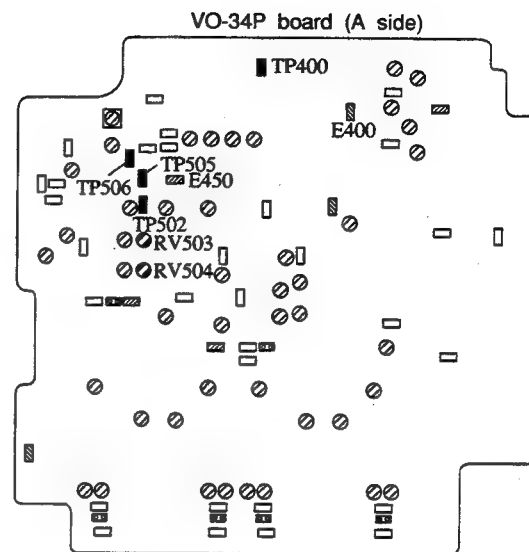
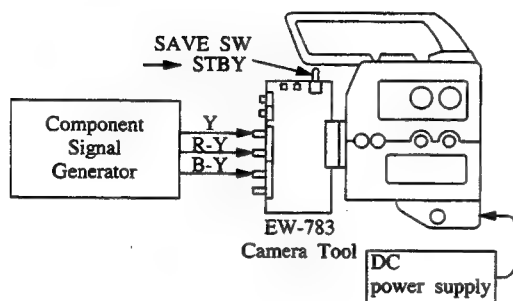




### 9-3-9. C LOW Clip / HIGH Clip Adjustment

**Equipment required:** Oscilloscope  
**Tool and connection:** Metal particle tape  
 Capacitor 680 PF

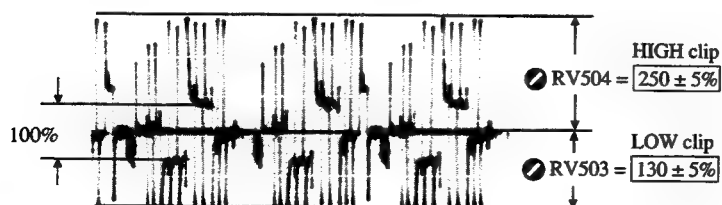
**Location:**



**Input signal:** PULSE & BARS (2, 4T)  
**Mode:** REC mode (metal particle tape)  
**Adjustments and specifications:**

1. Connect capacitor 680 PF between ■ TP505 and ■ TP506.
2. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP502      TRIG: ■ TP5 COMP SYNC



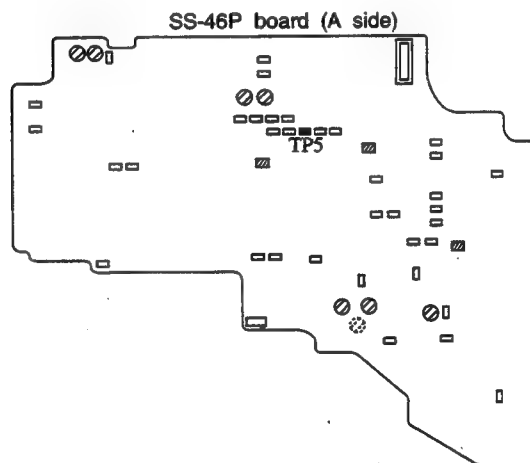
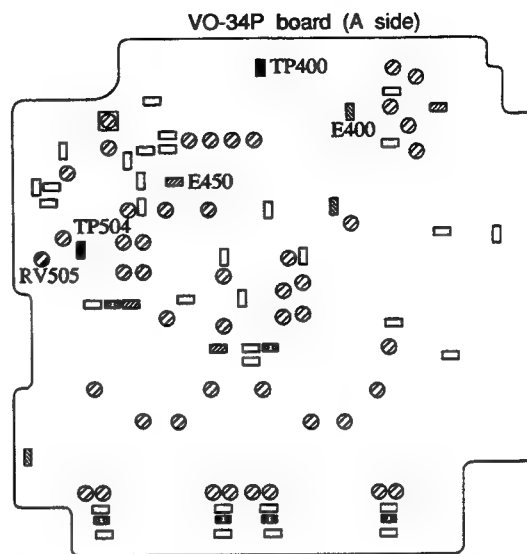
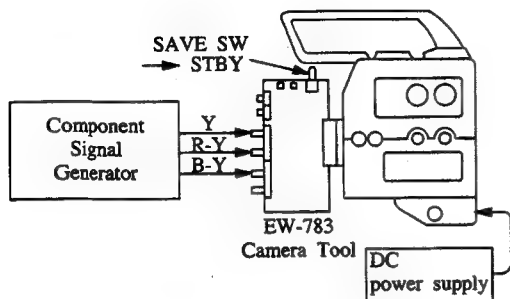
3. After adjustment, remove the capacitor 680 PF.

### 9-3-10. C REC HF Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



**Input signal:** 100% NALLOW LINE SWEEP

**Mode:** REC mode (metal particle tape)

**Adjustments and specifications:**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

■ TP504

TRIG: ■ TP5 COMP SYNC

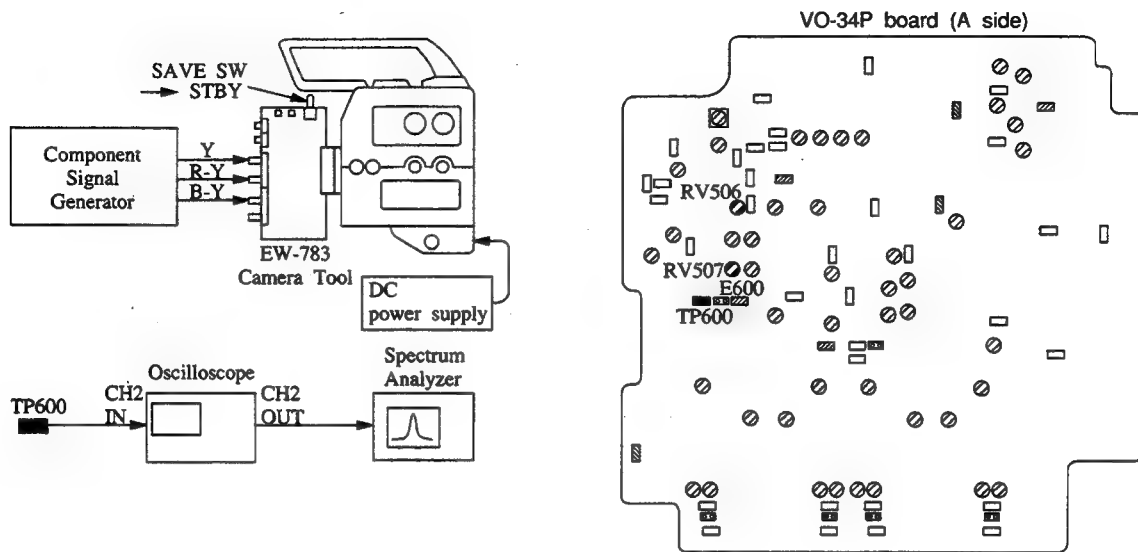


### 9-3-11. C Carrier Set / Deviation Adjustment - - - a) Using a Spectrum analyzer

**Equipment required :** Spectrum analyzer, Oscilloscope

**Location:**

**Tool and connection:** Metal particle tape



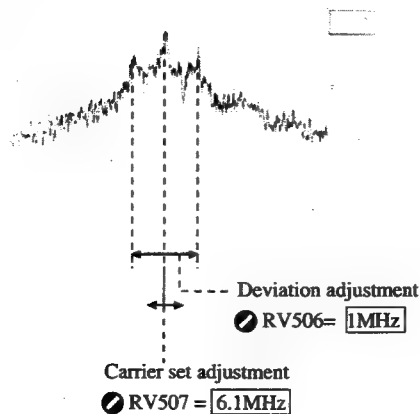
**Input signal:** 100% COLOR BARS

**Mode:** REC mode (metal particle tape)

**Adjustments and specifications :**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

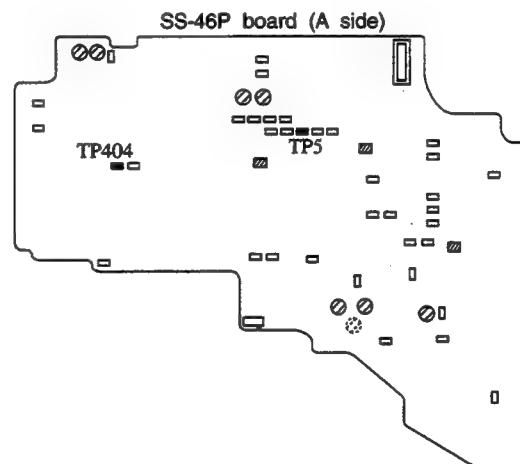
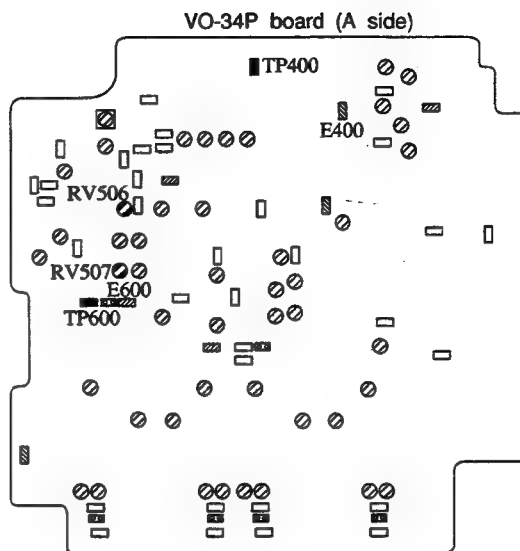
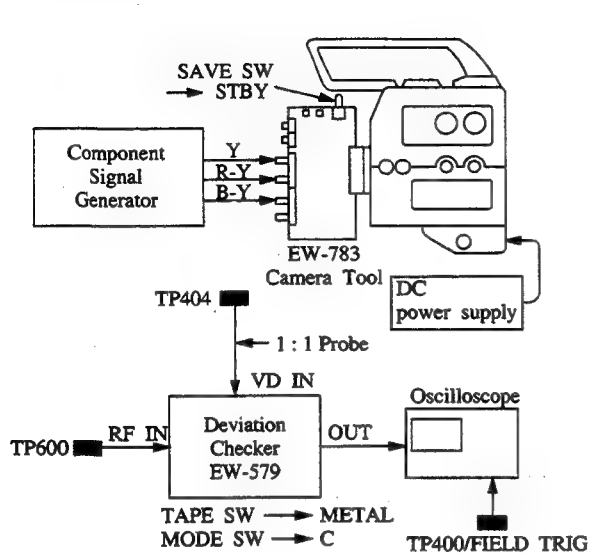
■ TP600 Spectrum analyzer waveform



# **C Carrier Set / Deviation Adjustment - - - b) Using a Deviation checker**

**Equipment required:** Deviation checker, Oscilloscope  
**Tool and connection:** Metal particle tape

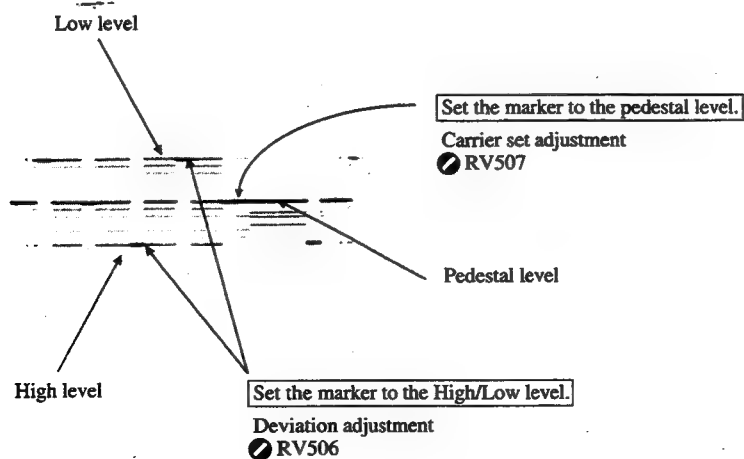
**Location:**



**Input signal:** 100% COLOR BARS  
**Mode:** REC mode (metal particle tape)  
**Adjustments and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP600      TRIG: ■ TP5 COMP SYNC

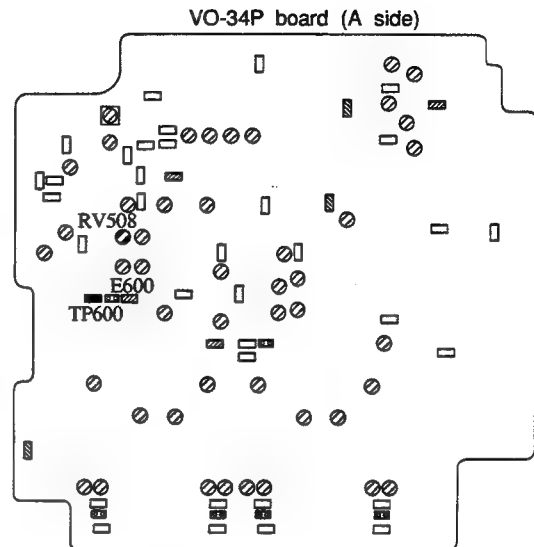
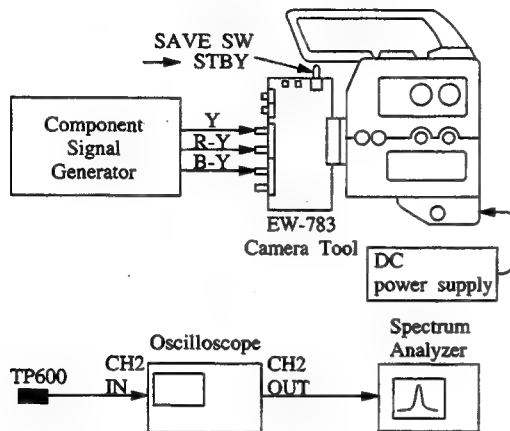


### 9-3-12. C Carrier Balance Adjustment

**Equipment required:** Spectrum analyzer, Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**



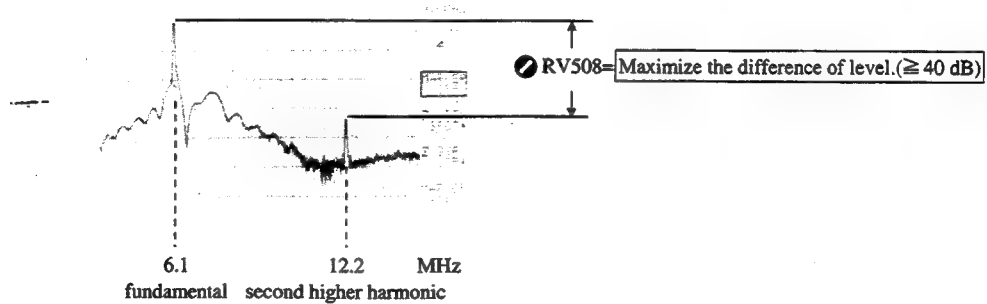
**Input signal:** 50% FLAT FIELD

**Mode:** REC mode (Metal particle tape)

**Adjustments and specifications:**

1. Press the **VTR S/S SW** button on the camera tool to put the unit into REC mode, and adjust.

■ TP600 Spectrum analyzer waveform

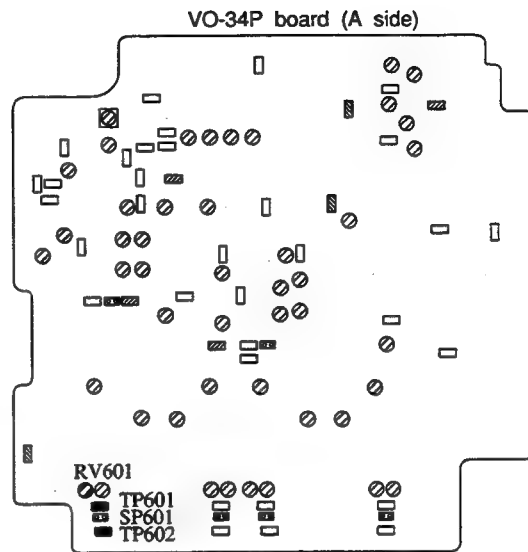
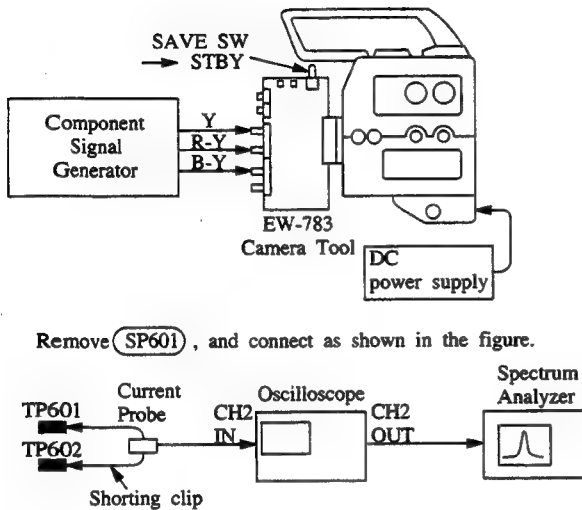


### 9-3-13. C A-CH Recording Current Secondary Distortion Adjustment

**Equipment required:** Spectrum analyzer,  
Oscilloscope (Current probe)

**Tool and connection:** Shorting clip x1  
Metal particle tape

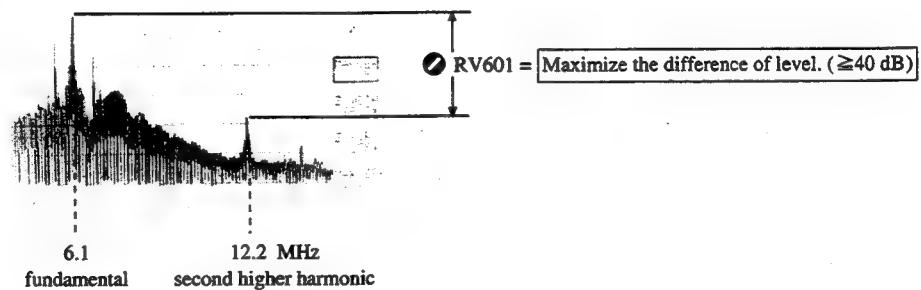
**Location:**



**Input signal:** 50% FLAT FIELD  
**Mode:** REC mode (metal particle tape)  
**Adjustments and specifications:**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

Spectrum analyzer waveform

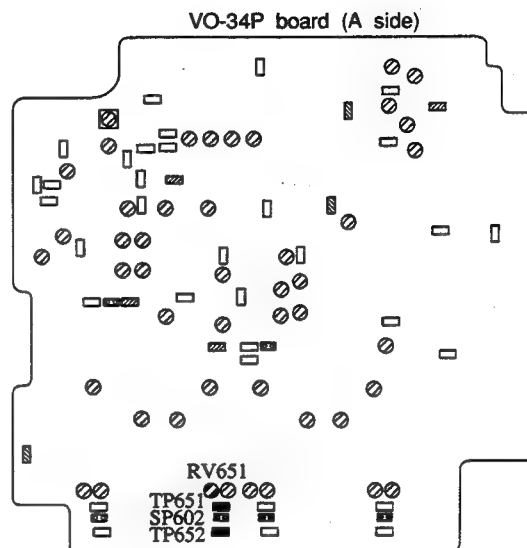
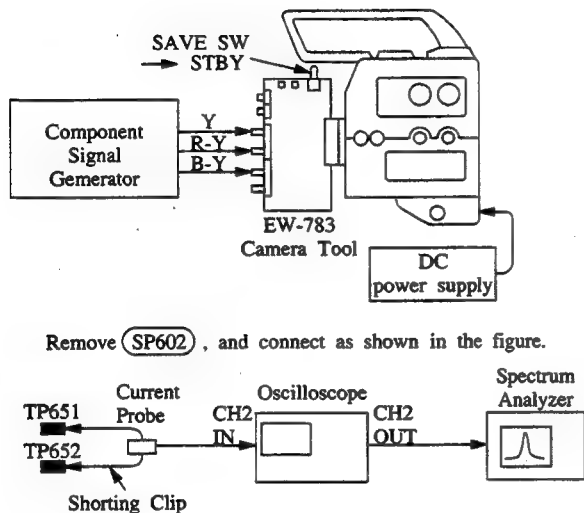


### 9-3-14. C B-CH Recording Current Secondary Distortion Adjustment

**Equipment required:** Spectrum analyzer,  
Oscilloscope (Current probe)

**Location:**

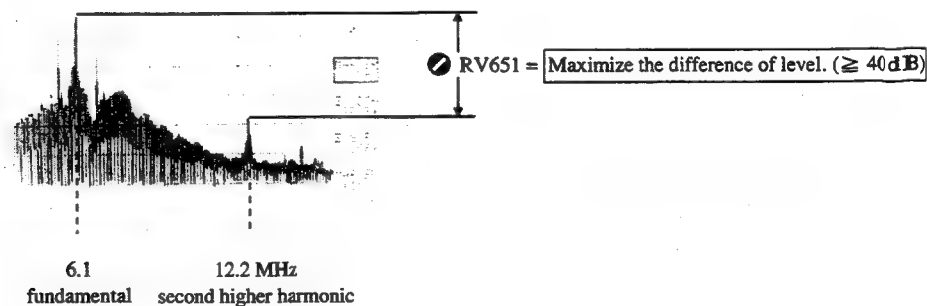
**Tool and connection:** Shorting clip x1  
Metal particle tape



**Input signal:** 50% FLAT FIELD  
**Mode :** REC mode (metal particle tape)  
**Adjustments and specifications :**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

Spectrum analyzer waveform

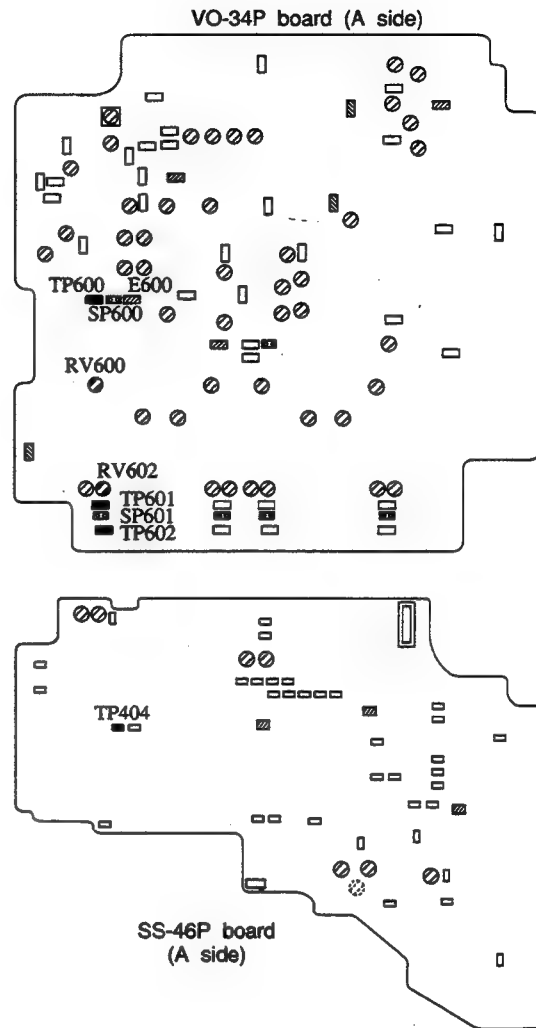
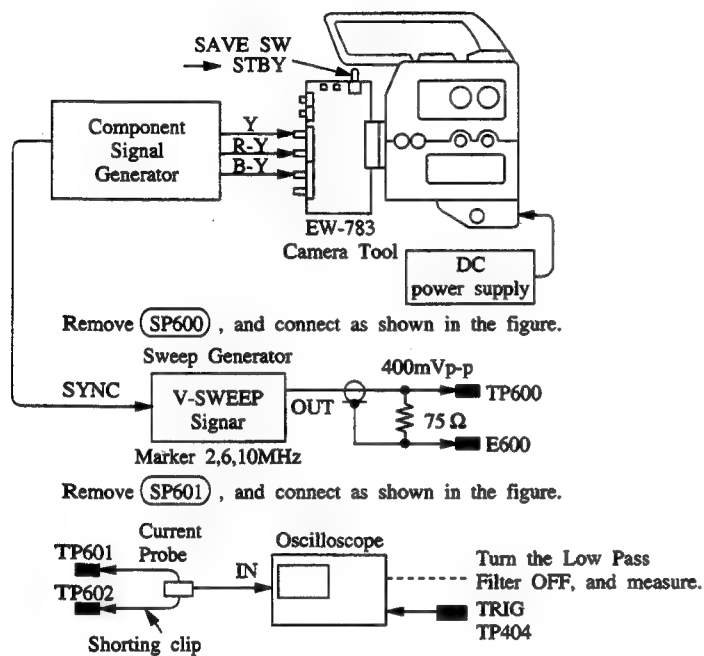


### 9-3-15. C A-CH Recording Current Frequency Response / Recording Current Level Adjustment

**Equipment required:** Oscilloscope (Current probe)

**Tool and connection:** Sweep generator  
Shorting clip x1  
Metal particle tape

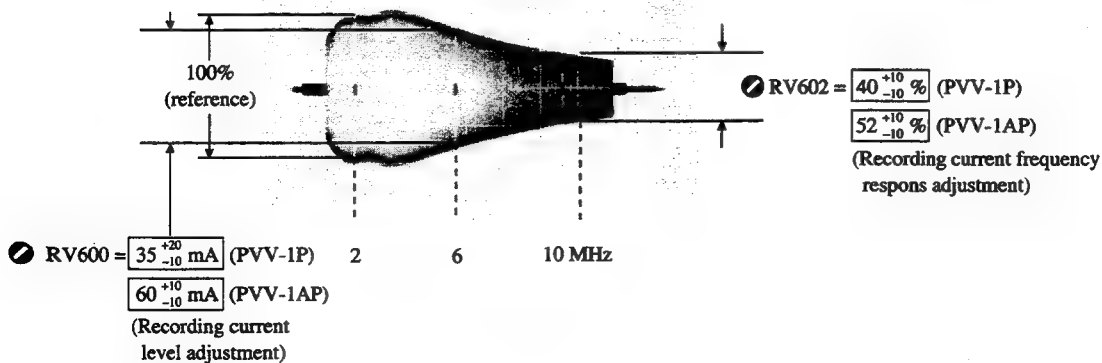
**Location:**



**Input signal:** V-SWEEP (400mVp-p)  
**Mode:** REC mode (metal particle tape)  
**Adjustments and specifications:**

1. Press the (VTR S/S SW) button on the camera tool to put the unit into REC mode, and adjust.

Oscilloscope TRIG: ■ TP404 SW PULSE



**NOTE:** Adjust RV602 and RV600 alternately to satisfy the specifications.



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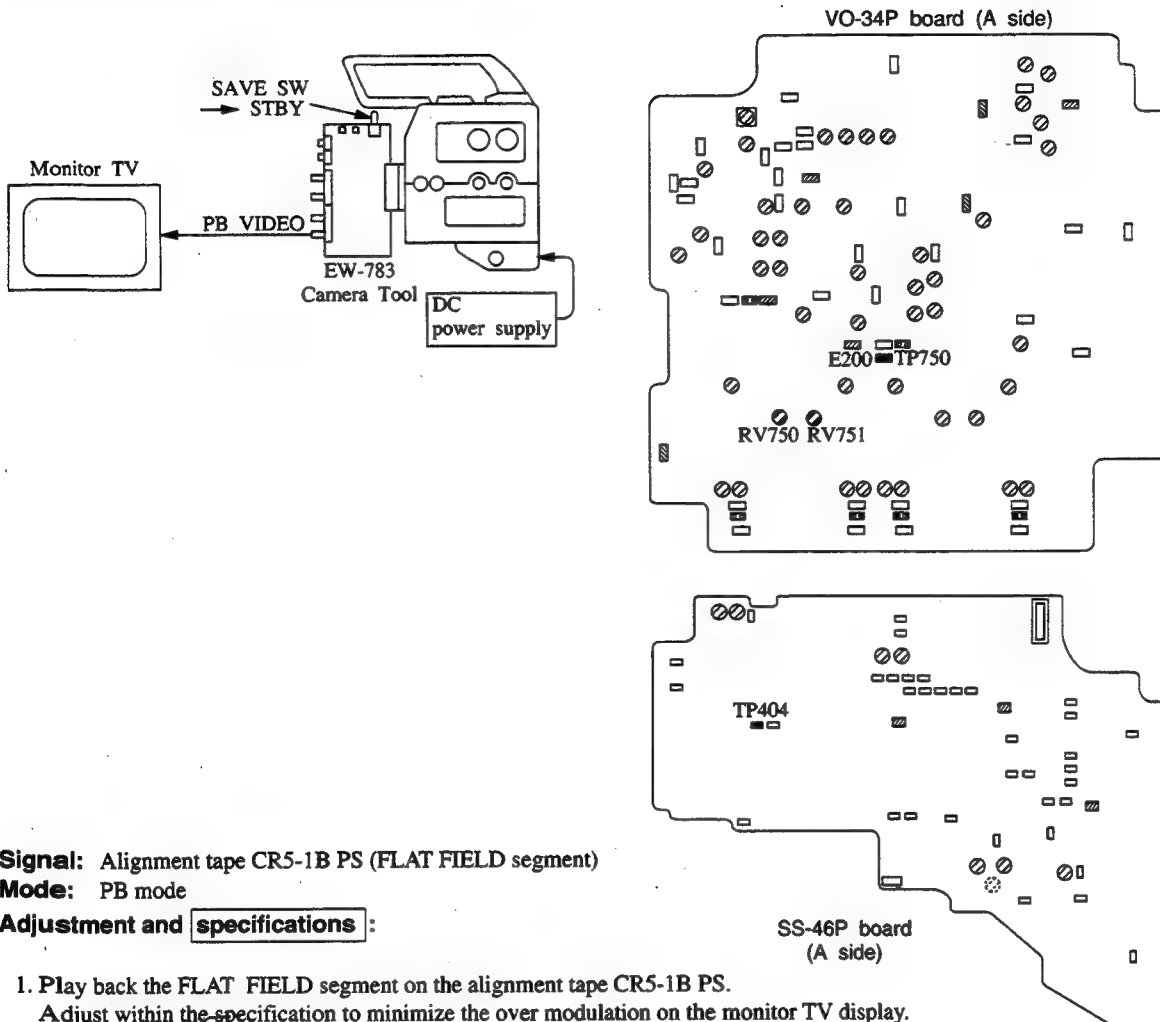
## 9-4. VIDEO PLAY BACK SYSTEM ADJUSTMENT

### 9-4-1. Y RF Level Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Alignment tape CR5-1B PS

**Location:**



**Signal:** Alignment tape CR5-1B PS (FLAT FIELD segment)

**Mode:** PB mode

**Adjustment and specifications:**

1. Play back the FLAT FIELD segment on the alignment tape CR5-1B PS.  
Adjust within the specification to minimize the over modulation on the monitor TV display.

$$ACH = BCH = 400 \pm 200 \text{ mVp-p}$$

■ TP700  
Y RF

TRIG: ■ TP404  
SW PULSE



ACH  
RV700

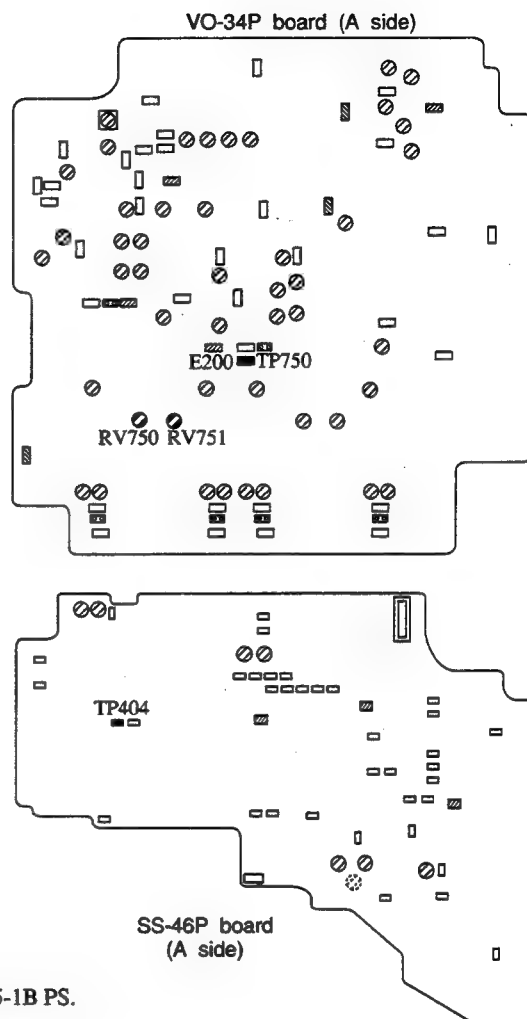
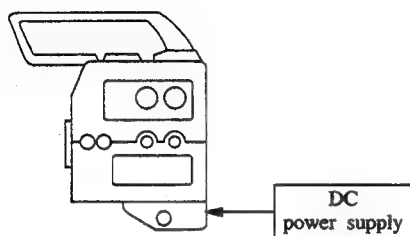
BCH  
RV701

## 9-4-2. C RF Level Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Alignment tape CR5-1B PS

**Location:**



**Signal:** Alignment tape CR5-1B PS (FLAT FIELD segment)

**Mode:** PB mode

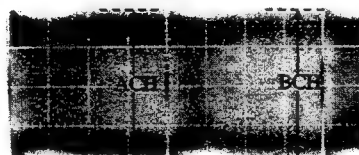
**Adjustment and specifications:**

1. Play back the FLAT FIELD segment on the alignment tape CR5-1B PS.

$$ACH = BCH = 400 \pm 100 \text{ mVp-p}$$

■ TP750  
C RF

TRIG: ■ TP404  
SW Pulse



ACH  
RV750

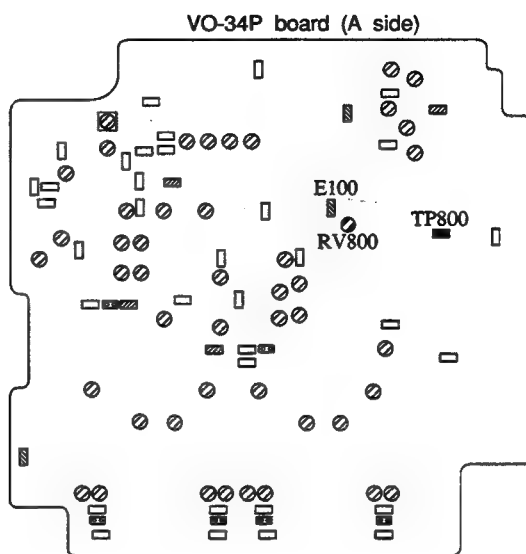
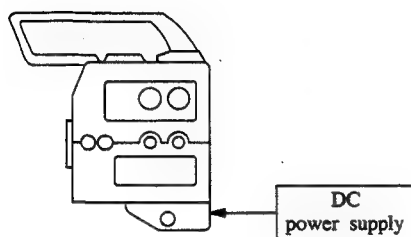
BCH  
RV751

### 9-4-3. VF Play Back Output Level Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Alignment tape CR5-1B PS

**Location:**



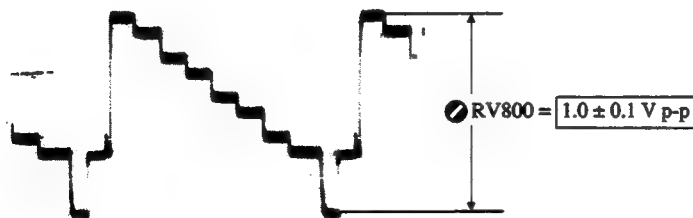
**Signal:** Alignment tape CR5-1B PS (COLOR BARS segment)

**Mode:** PB mode

**Adjustment and specifications:**

1. Play back the COLOR BARS segment on the alignment tape CR5-1B PS.

■ TP800 PB VIDEO

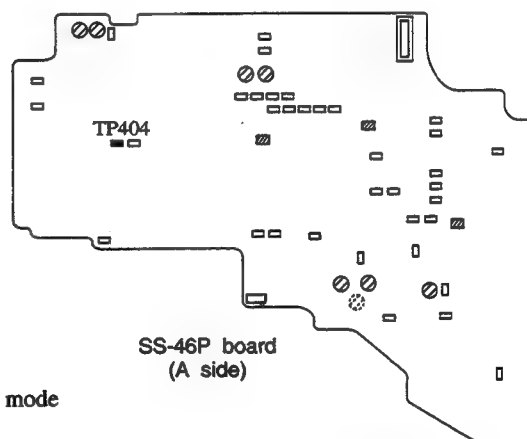
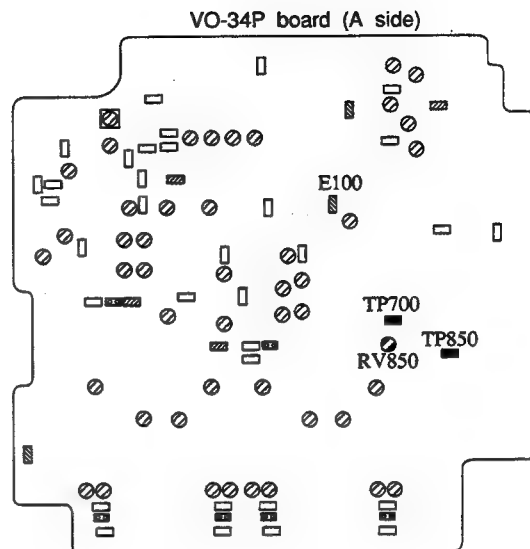
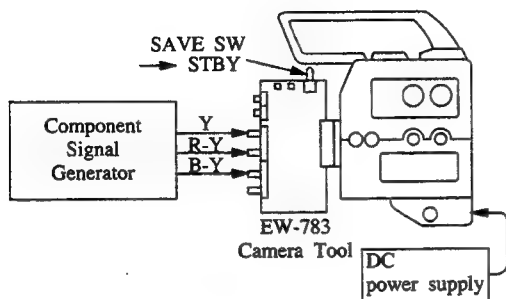


#### 9-4-4. RF Alarm Adjustment

**Equipment required:** Oscilloscope

**Tool and connection:** Metal particle tape

**Location:**

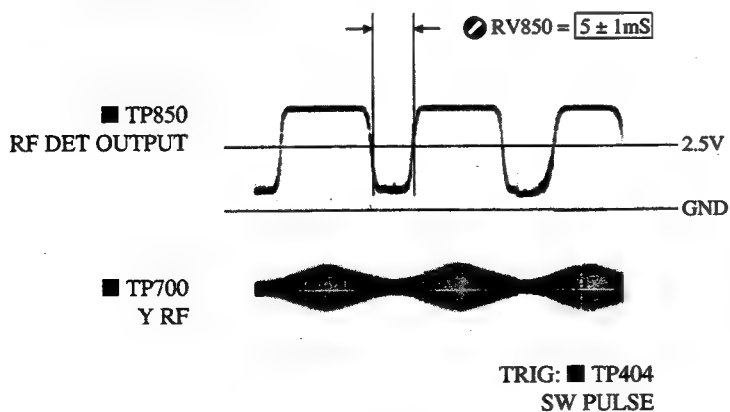


**Input Signal:** 50% FLAT FIELD

**Mode:** REC mode (metal particle tape) → REC PAUSE mode

**Adjustment and specifications :**

1. Press the **VTR S/S SW** button to put the unit into REC mode for a few seconds, and press the **VTR S/S SW** button to put the unit into PAUSE mode, and adjust.

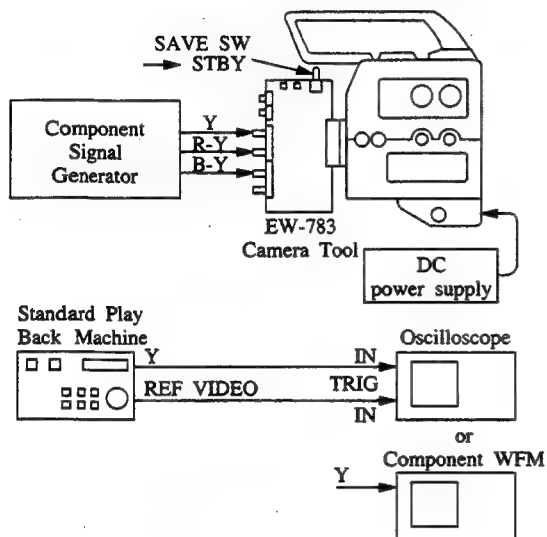


## 9-5. VIDEO OVERALL ADJUSTMENT

### 9-5-1. Y Recording Frequency Response Check

**Equipment required:** Oscilloscope or Component WFM

**Tool and connection:** Metal particle tape  
Alignment tape (CR5-1B PS)

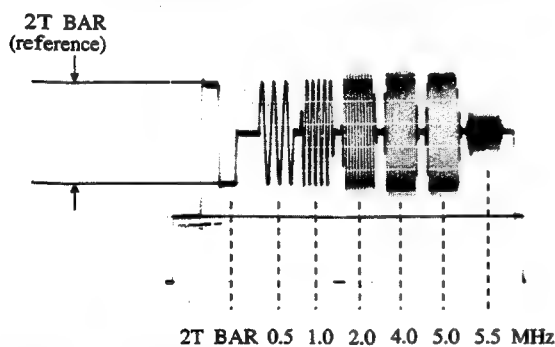


**Input signal:** 60% MULTI BURST

**Mode:** REC → Measuring (Play back with a standard play back machine) → adjustment

**Adjustment and specifications:**

1. Play back the MULTI BURST portion on the alignment tape (CR5-1B PS) with a standard play back machine, and measure.



2. Press the **VTR S/S SW** button, and record for about 30 seconds with PVV-1P.
3. Play back the recorded portion with a standard play back machine. Measure the level of each frequency at the level MULTI BURST 2T portion.
4. When the specification is not satisfied, re-adjust section 9-2-13,14 Recording Current Frequency Response Adjustment within the specification.

Overall frequency response	Recording current frequency response
↘ Low	↗ High
↗ High	↘ Low

Specification / CH-A and CH-B

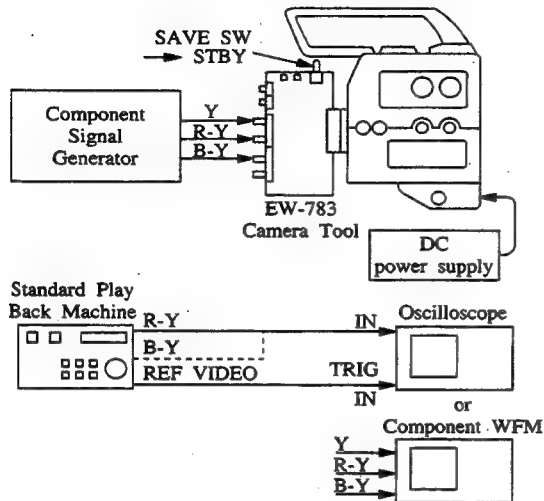
Frequency (MHz)	against measured value of alignment tape (dB)	(%)
2T BAR	reference 0 dB	reference 100%
0.5	+0.4 -0.5 dB	+4.7 -5.6 %
1.0	+0.4 -0.5 dB	+4.7 -5.6 %
2.0	+0.4 -0.5 dB	+4.7 -5.6 %
4.0	±0.5 dB	+5.9 -5.6 %
5.0	±1.0 dB	+12.2 -10.9 %
5.5	±1.0 dB	+12.2 -10.9 %

- Measure at the center of Moire.
- Difference of between A-CH and B-CH shall be within 0.4dB (4.7%) at 5.0MHz.

## 9-5-2. C Recording Frequency Response Check

**Equipment required:** Oscilloscope or Component WFM

**Tool and connection:** Metal particle tape  
Alignment Tape(CR5-1B PS)

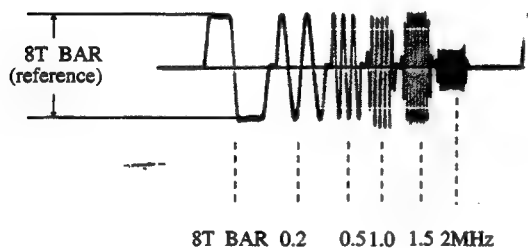


**Input signal :** 60% MULTI BURST

**Mode:** → REC → Measuring (Play back with a standard play back machine) → adjustment

**Adjustment and specifications :**

1. Play back the MULTI BURST portion on the alignment tape (CR5-1B PS) with a standard play back machine, and measure.



2. Press the (VTR S/S SW) button, and record for about 30 seconds with PVV-1P.
3. Play back the recorded portion with a standard play back machine. Measure the level of each frequency at the level MULTI BURST 8T portion.
4. When the specification is not satisfied, re-adjust section 9-2-13,14 Recording Current Frequency Response Adjustment within the specification.

Overall frequency response	Recording current frequency response
↘ Low	↗ High
↗ High	↘ Low

Specification / CH-A and CH-B

Frequency (MHz)	against measured value of alignment tape (dB)	(%)
8T BAR	reference 0 dB	reference 100%
0.2	+0.4 -1.0 dB	+4.7 -10.9 %
0.5	+0.4 -1.0 dB	+4.7 -10.9 %
1.0	+0.4 -1.0 dB	+4.7 -10.9 %
1.5	+0.4 -1.5 dB	+4.7 -15.9 %
2.0	±1.5 dB	+18.9 -15.9 %

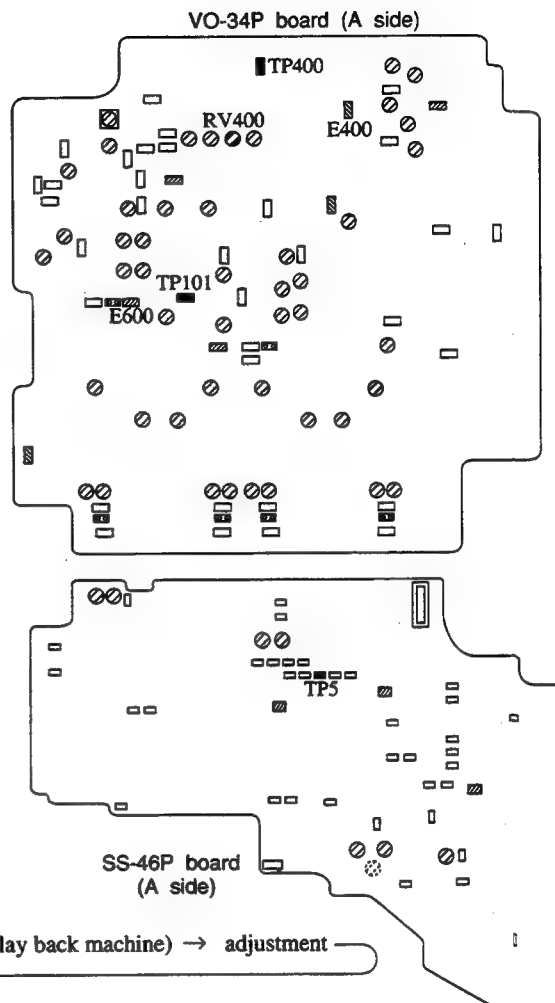
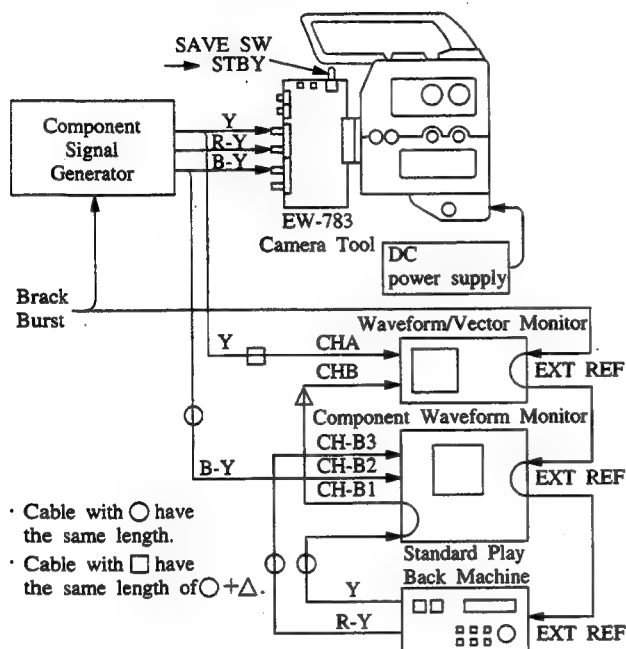
- Measure at the center of moire.
- Difference of between CH-A and CH-B shall be within 0.4dB (4.7%) at 1.5 MHz.

### 9-5-3. Recording Video Phase Adjustment

**Equipment Required:** Component waveform monitor, Oscilloscope, Waveform/vector monitor

**Tool and connection:** Metal particle tape Alignment tape (CR5-1B PS)

**Location:**



**Input signal :** BOWTIE

**Mode:** → REC → Measuring (Play back with a standard play back machine) → adjustment

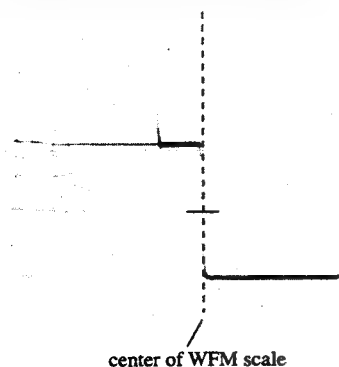
**Adjustment and specifications :**

Adjust the SYNC PHASE with a standard play back machine that the Play back Video Phase is aligned by the alignment tape, and perform the adjustment.

1. Play back the alignment tape (CR5-1B PS) with a standard play back machine, and adjust the SYNC PHASE.

Waveform/vector monitor --- EXT TRIG mode

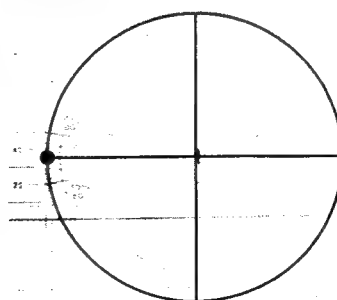
WFM mode Rough adjustment



① Select the CH-A, and set the H position of waveform/vector monitor to center of scale.

② Select the CH-B, and set the SYNC PHASE of the play back machine to center of scale.

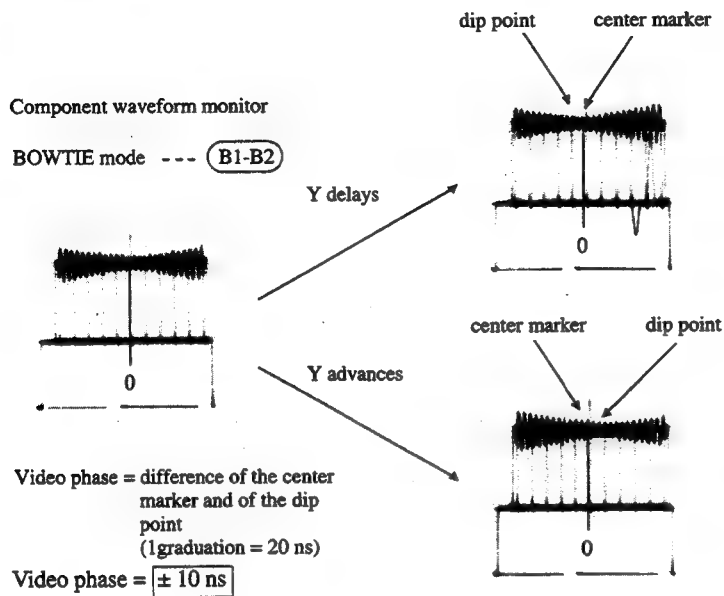
SCH mode Fine adjustment



③ Change the CH-A and CH-B alternately, and set the phase of CH-B to the phase of CH-A at the SYNC PHASE of the play back machine.



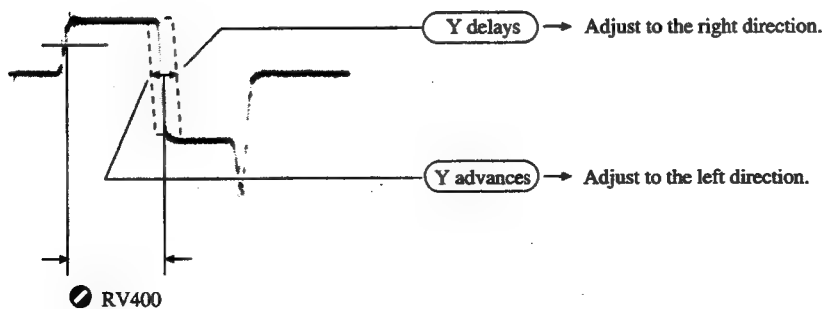
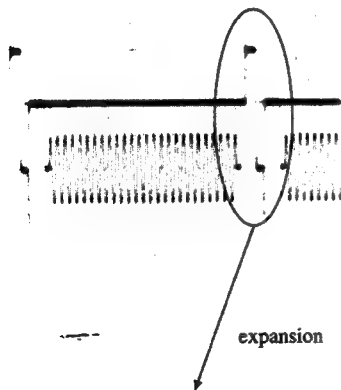
2. Press the **(VTR S/S SW)** button on the camera tool, and record. Play back the recorded portion with a standard play back machine, and measure the Video Phase.



When the specification is not satisfied, adjust **RV400** (Y REF SYNC position) in REC mode.

■ TP101 Y

TRIG: ■ TP5 COMP SYNC

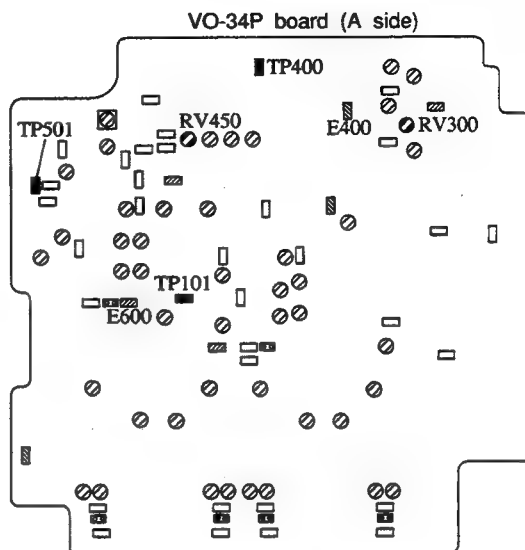
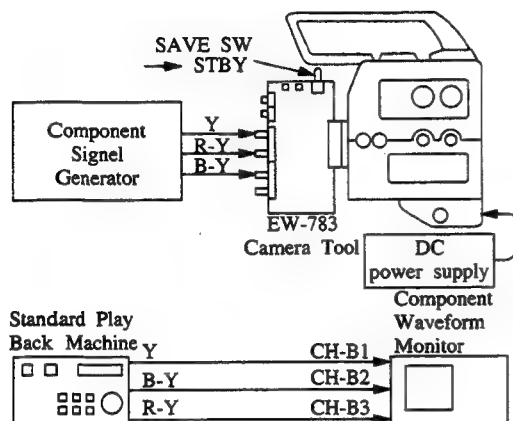


**9-5-4. Recording Y/C Delay, Recording C/C Delay Adjustment**  
(This adjustment must be performed after section 9-5-3 Recording Video Phase Adjustment is completed.)

**Equipment required:** Component waveform monitor,  
Oscilloscope,

**Location:**

**Tool and connection :** Metal particle tape



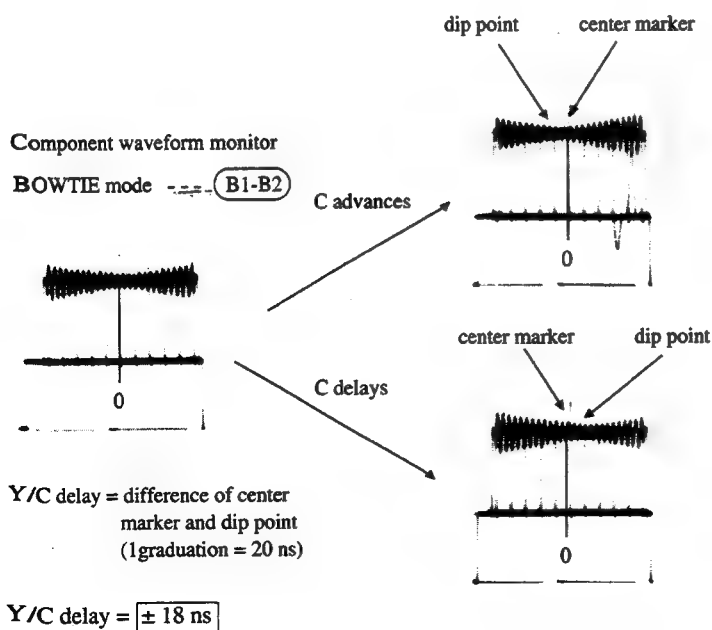
**Input signal :** BOWTIE

**Mode:** → REC → Measuring (Play back with a standard play back machine) → adjustment

**Adjustment and specifications :**

Use a standard play back machine adjusted the Play Back Y/C Delay and Play Back C/C Delay by the alignment tape.

1. Press the **VTR S/S SW** button on the camera tool, and record.  
Play back the recorded portion with a standard play back machine, and measure the Y/C delay.

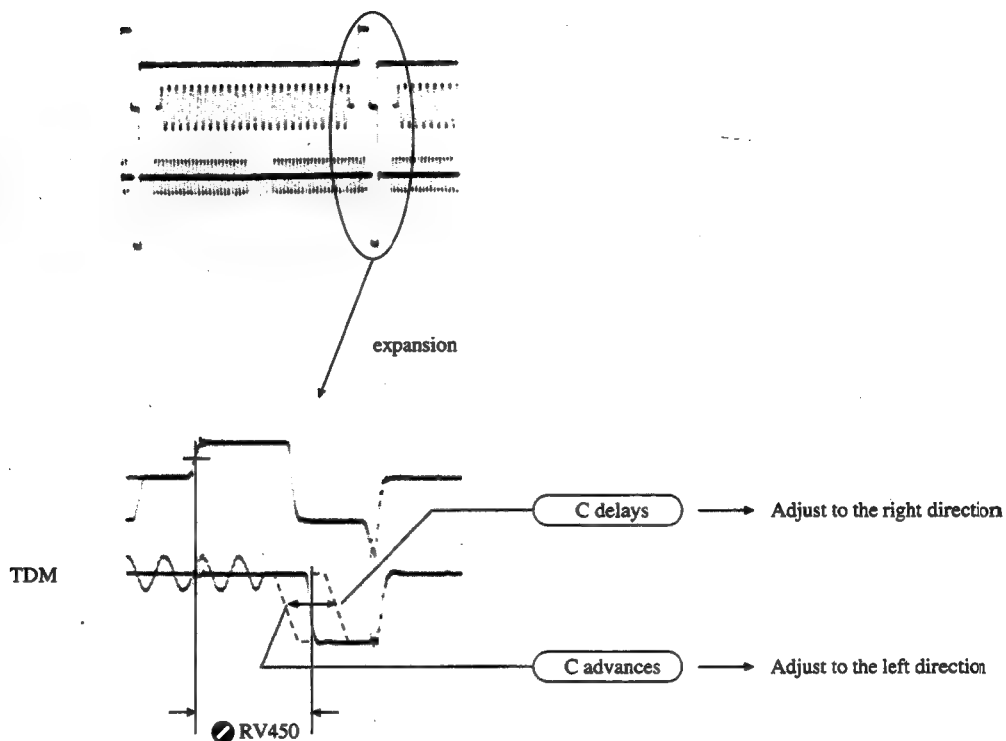


When the specification is not satisfied, adjust a  $\odot$  RV450 (C REF SYNC position) in REC mode.

TRIG: ■ TP400 COMP SYNC

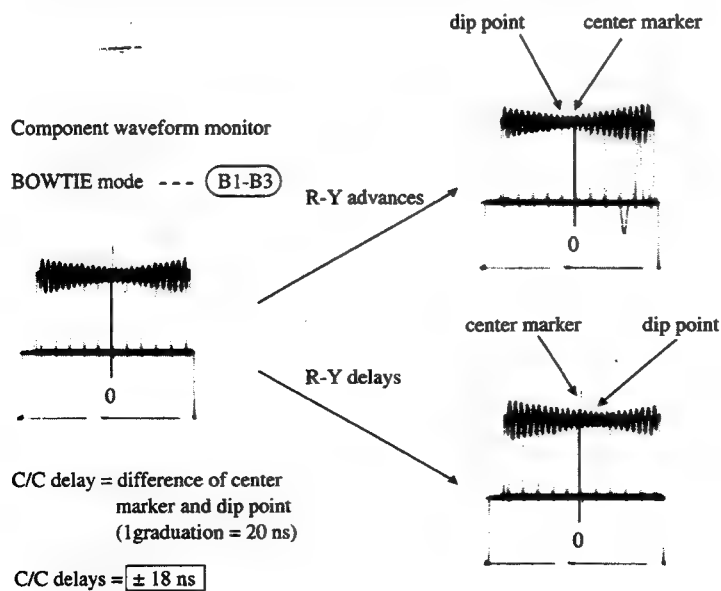
■ TP101  
Y

■ TP501  
CTDM



2. Press the **VTR S/S SW** button on the camera tool, and record.

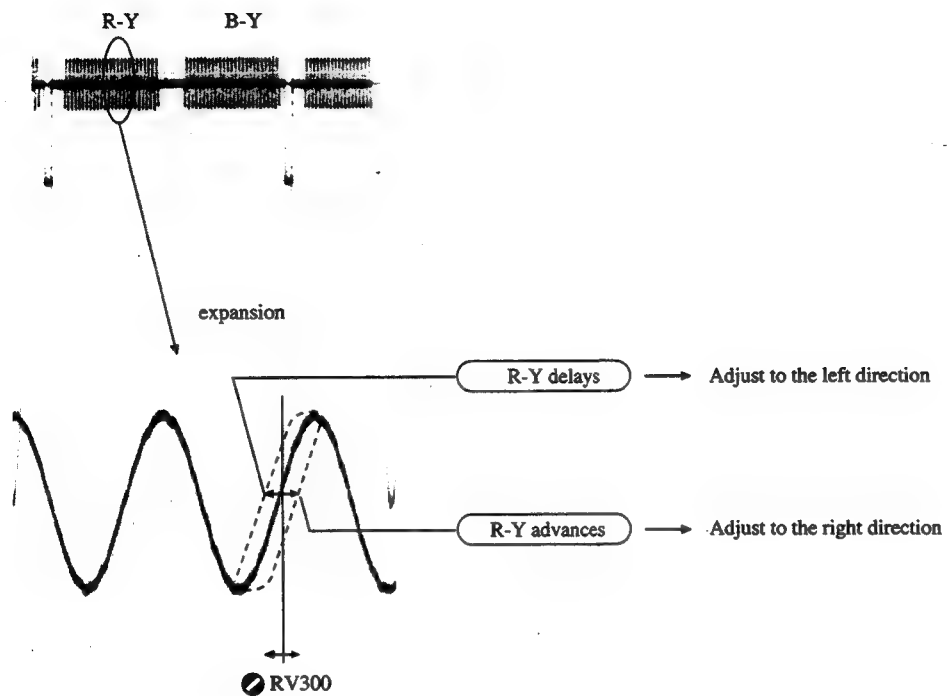
Play back the recorded portion with a standard play back machine, and measure the C/C delay.



When the specification is not satisfied, adjust ⒶRV300 (C/C delay) in REC mode.

■ TP501 CTDM

TRIG: ■ TP400 COMP SYNC



**SONY**

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PORTABLE VIDEOCASSETTE RECORDER

# **PVV-1P**

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## **SERVICE MANUAL**

Vol.2 1st Edition Revised 1  
Serial No.10001 and Higher

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**BETACAM SP**  
**2000 PRO**

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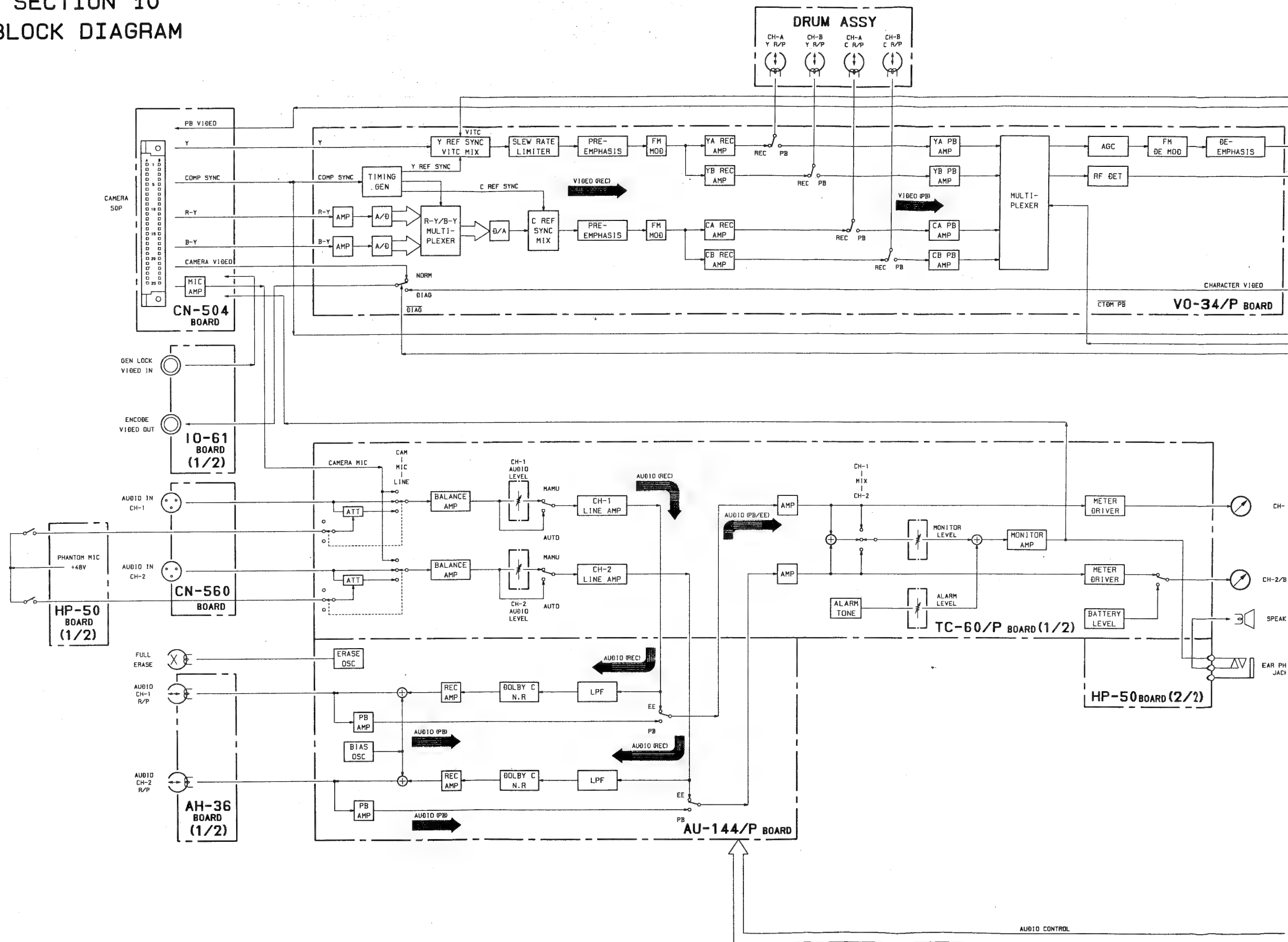
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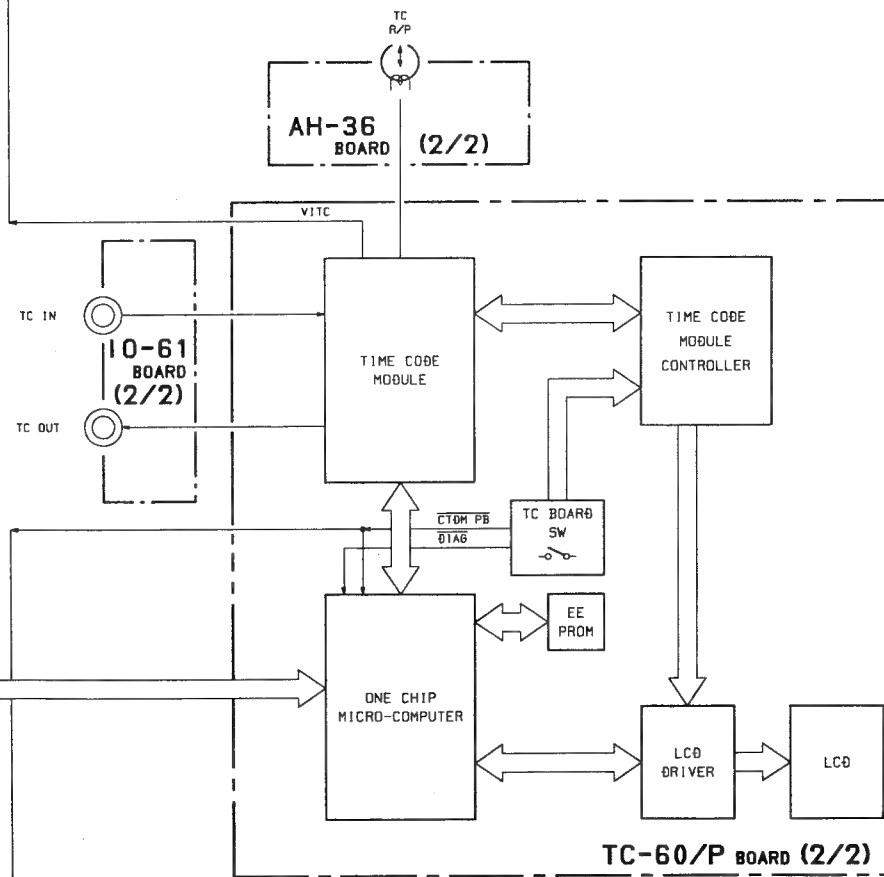
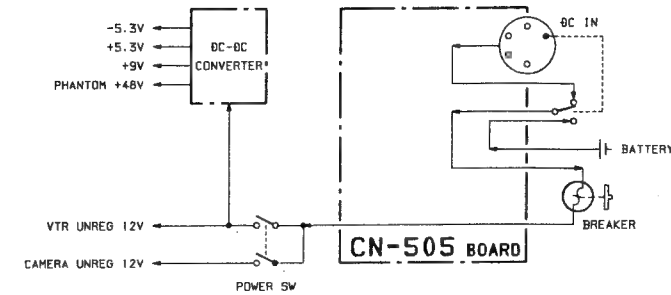
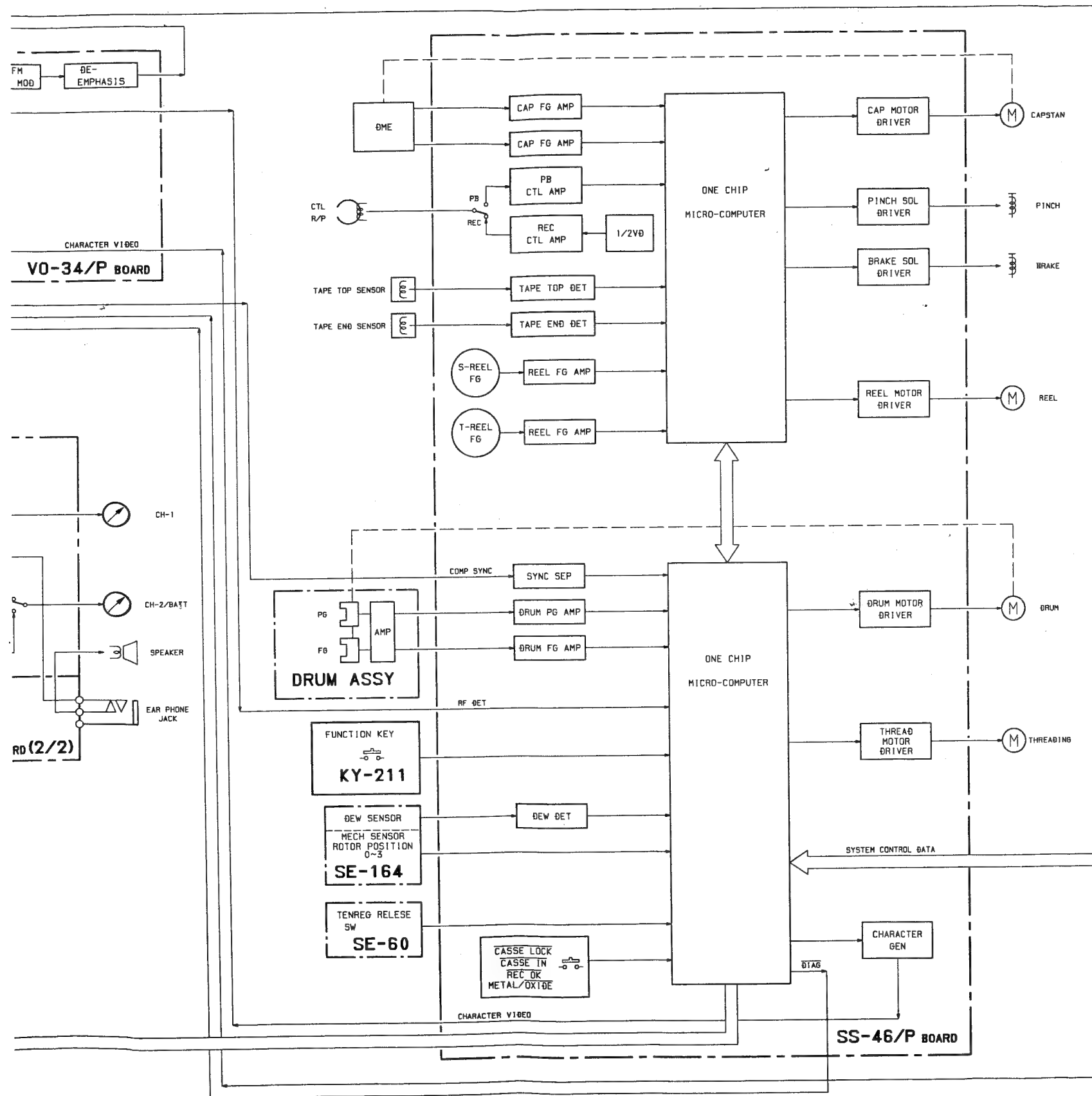
## OVERALL BLOCK DIAGRAM





# OVERALL BLOCK DIAGRAM

# OVERALL BLOCK DIAGRAM



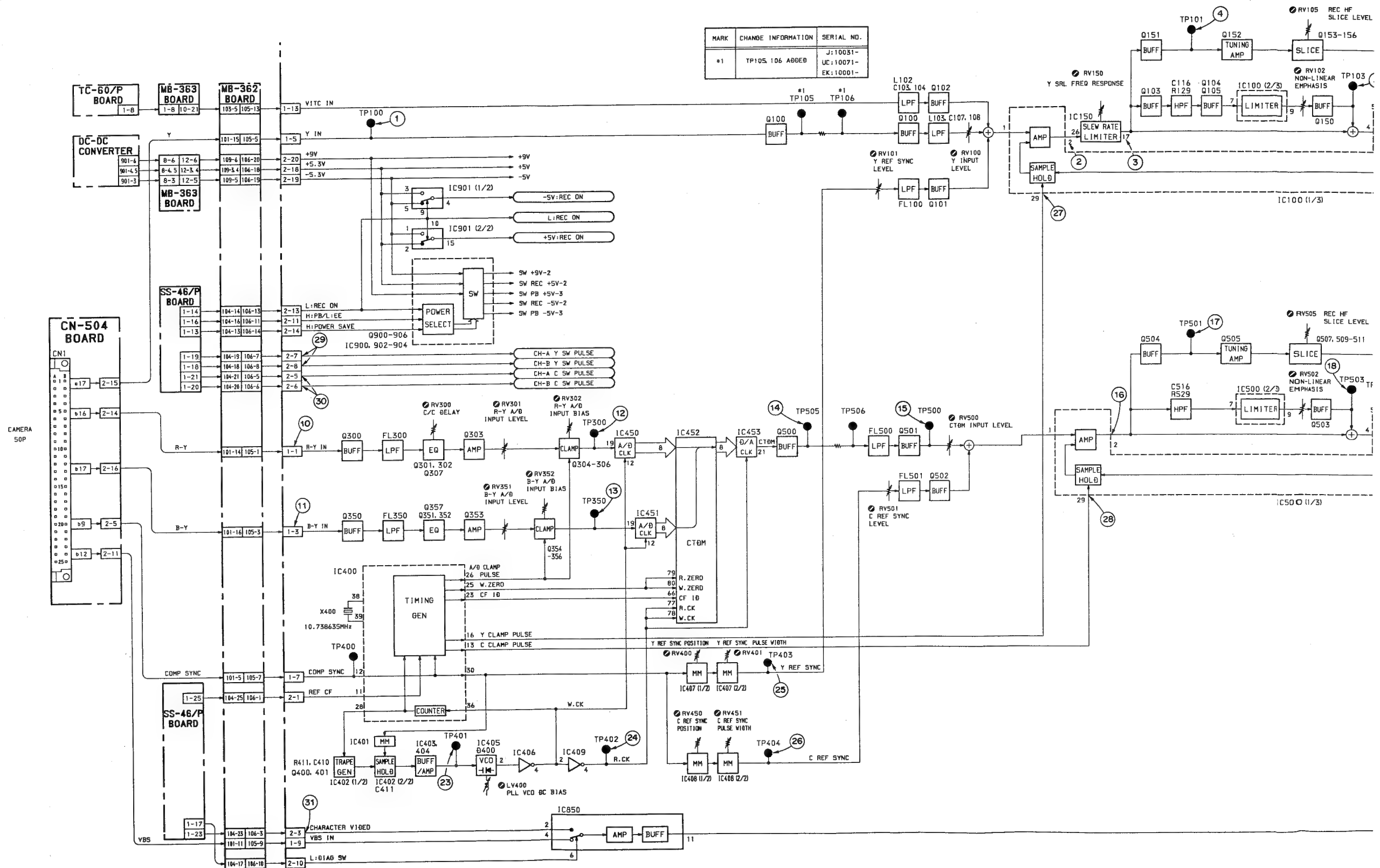
## OVERALL BLOCK DIAGRAM

PVV-1 (J) : #10001-  
 PVV-1 (UC) : #10001-  
 PVV-1P (EK) : #10001-

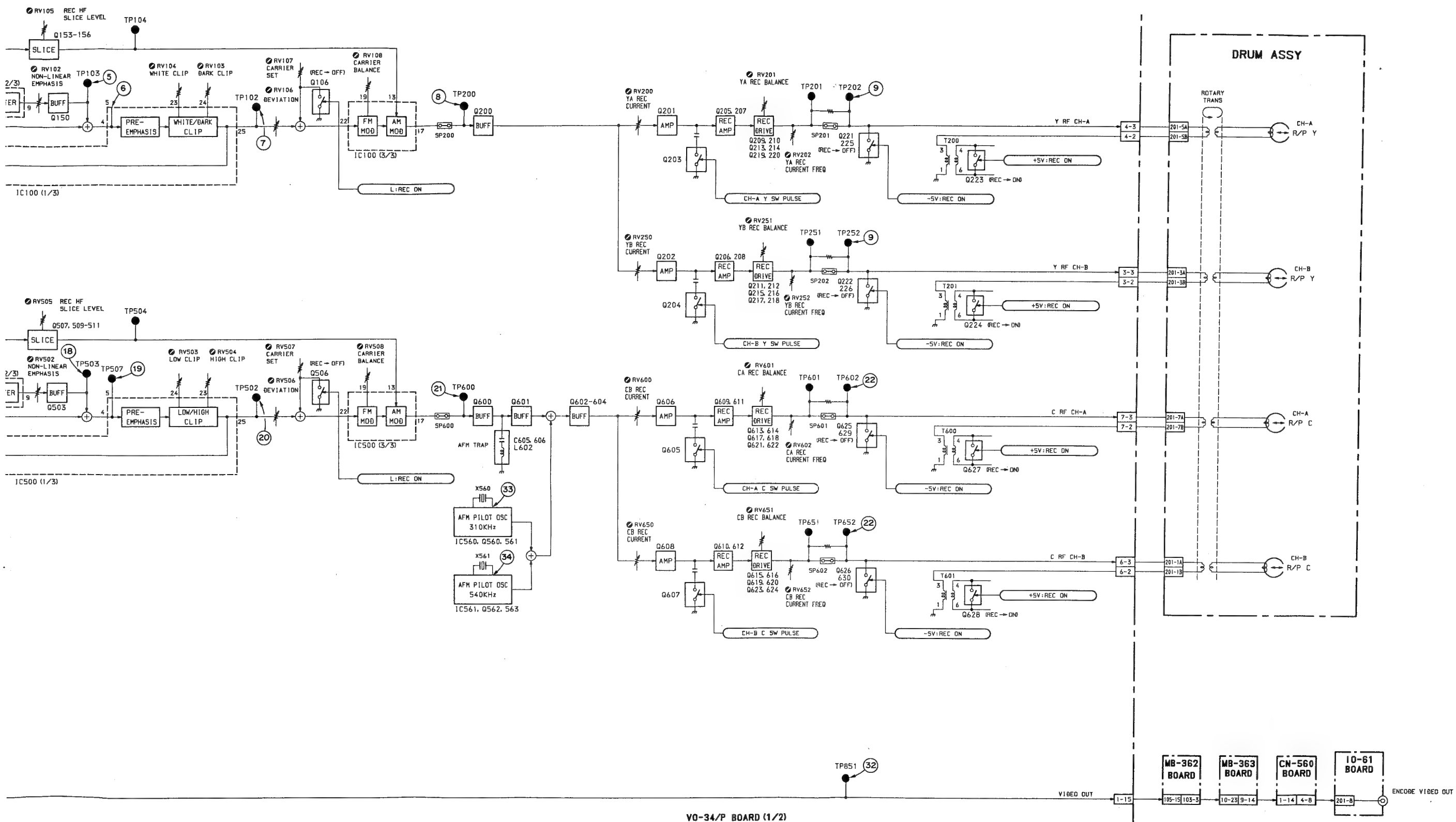
VIDEO (1/2) BLOCK DIAGRAM  
Video REC

VO-34/P BOARD (1/2)

REF NO.	ADDRESS	REF NO.	ADDRESS
CN1	F-2	RV502	A-2
CN2	F-4	RV503	B-2
CN3	D-5	RV504	B-3
CN4	D-5	RV505	A-3
CN6	B-5	RV506	A-2
CN7	B-5	RV507	A-3
IC100	C-2	RV508	B-2
IC150	B-3	RV600	A-4
IC400	D-1	RV601	A-5
IC401	B-1	RV602	A-5
IC402	C-1	RV650	C-4
IC403	B-1	RV651	B-5
IC404	B-1	RV652	C-5
IC405	B-1	TP100	C-2
IC406	B-2	TP101	B-3
IC407	C-1	TP102	D-3
IC408	B-1	TP103	C-3
IC409	B-1	TP104	C-3
IC450	D-1	TP105	C-2
IC451	D-1	TP106	C-2
IC452	C-1	TP200	C-3
IC453	C-2	TP201	D-5
IC500	A-2	TP202	C-5
IC560	A-5	TP251	D-5
IC581	A-4	TP252	E-5
IC850	F-2	TP300	E-1
IC900	E-4	TP350	E-1
IC901	F-3	TP400	C-1
IC902	F-4	TP401	B-1
IC903	F-4	TP402	B-2
IC904	F-4	TP403	B-2
LV400	A-1	TP404	B-1
RV100	C-2	TP500	A-2
RV101	B-2	TP501	A-2
RV102	C-3	TP502	B-2
RV103	D-3	TP503	A-2
RV104	D-3	TP504	A-3
RV107	D-3	TP505	B-2
RV108	C-3	TP506	B-2
RV150	B-3	TP507	A-2
RV200	C-4	TP600	A-3
RV201	C-5	TP601	A-5
RV202	C-5	TP602	A-5
RV250	D-4	TP651	C-5
RV251	D-5	TP652	C-5
RV252	E-5	TP851	F-2
RV300	E-1	X400	D-1
RV301	E-1	X560	A-5
RV302	E-1	X561	A-4
RV351	E-1		
RV352	E-2		
RV400	C-2		
RV401	C-2		
RV450	B-2		
RV451	C-2		
RV500	A-2		
RV501	A-1		



# VIDEO (1/2) BLOCK DIAGRAM VIDEO (1/2) BLOCK DIAGRAM

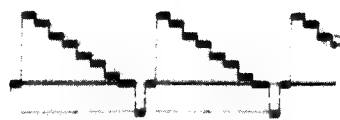


VO-34/P BOARD.....11-2 PAGE

## VIDEO (1/2) BLOCK DIAGRAM

PVV-1 (J) : #10001-  
 PVV-1 (UC) : #10001-  
 PVV-1P (EK) : #10001-

① ■ TP100 Y 1Vp-p REC mode



② IC100-2 pin 1Vp-p REC mode



③ IC150-17 pin 1Vp-p REC mode



④ ■ TP101 Y 1Vp-p REC mode



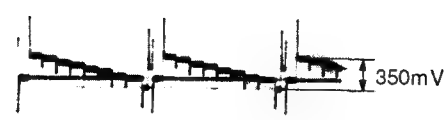
⑤ ■ TP103 100mVp-p REC mode



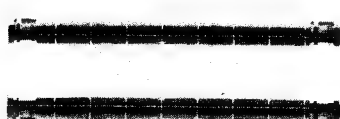
⑥ IC100-5 pin 360mVp-p REC mode



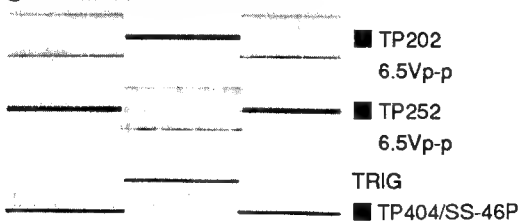
⑦ ■ TP102 REC mode



⑧ ■ TP200 Y-FM 440mVp-p REC mode



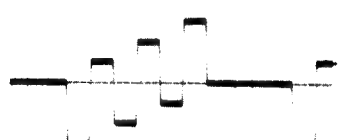
⑨ REC mode



⑩ CN1-1 pin R-Y 700mVp-p REC mode



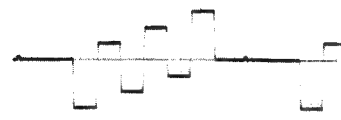
⑪ CN1-3 pin B-Y 700mVp-p REC mode



⑫ ■ TP300 R-Y 1.45Vp-p REC mode



⑬ ■ TP350 B-Y 1.45Vp-p REC mode



⑭ ■ TP505 CTDM 1.45Vp-p REC mode



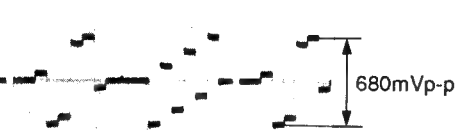
⑮ ■ TP500 CTDM 715mVp-p REC mode



⑯ IC500-2 pin CTDM REC mode



⑰ ■ TP501 REC mode



⑱ ■ TP503 45mVp-p REC mode



⑲ ■ TP507 REC mode



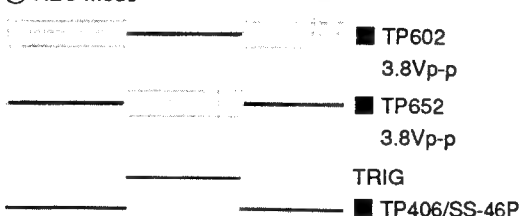
⑳ ■ TP502 REC mode



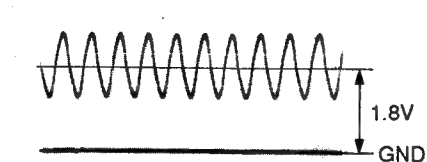
㉑ ■ TP600 C-FM 440mVp-p REC mode



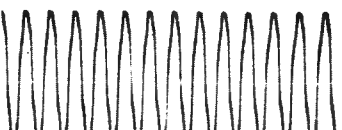
㉒ REC mode



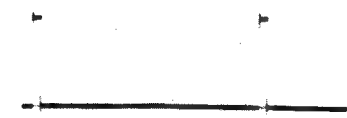
㉓ ■ TP401 PLL VCO REC mode



㉔ ■ TP402 R-CK 6Vp-p REC mode



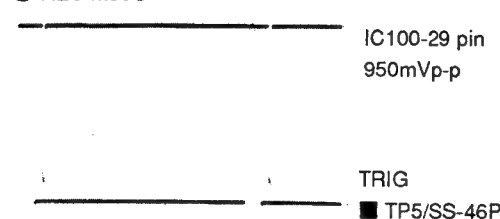
㉕ ■ TP403 Y REF SYNC 5Vp-p REC mode



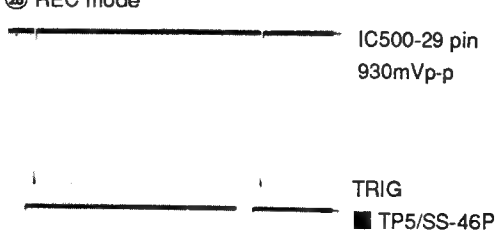
㉖ ■ TP404 C REF SYNC 5Vp-p REC mode



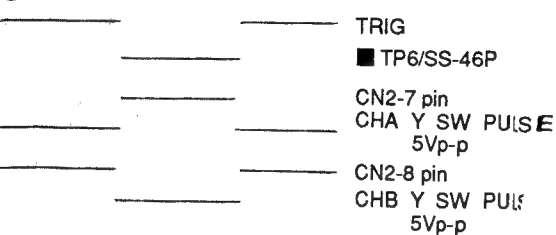
㉗ REC mode



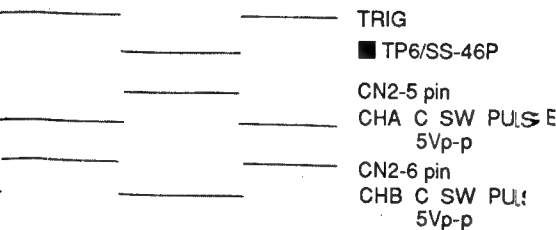
㉘ REC mode



㉙ REC mode



㉚ REC mode



㉛ CN2-3 pin



㉜ ■ TP85



㉝ ■ IC56

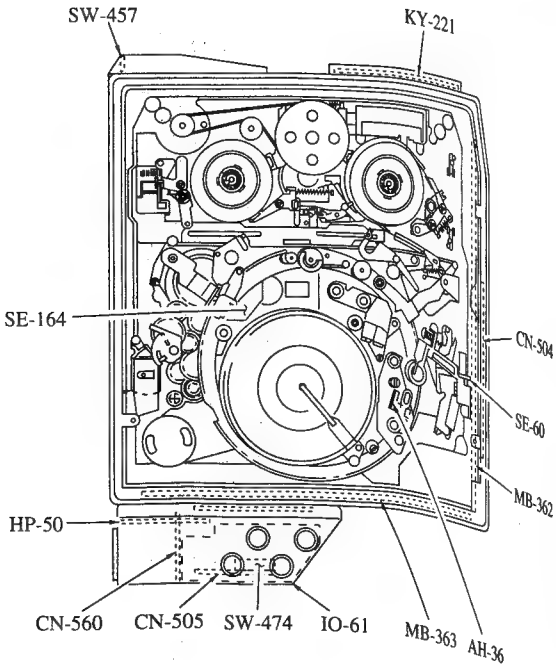
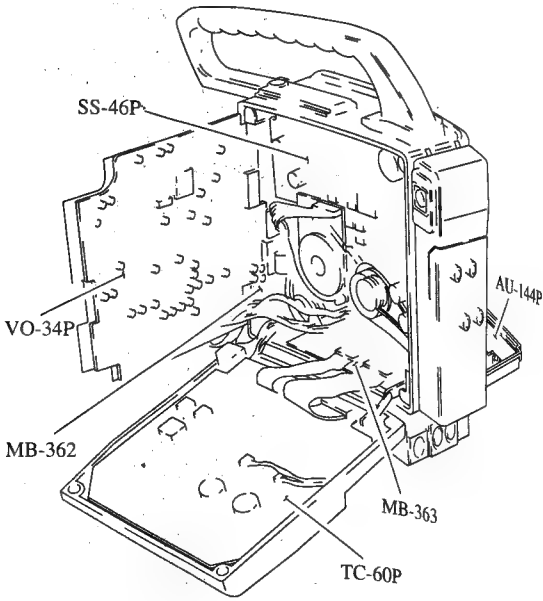


㉞ ■ IC56



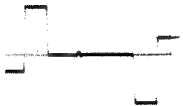
REC  
PB n

Location of the Printed Circuit Boards



REC mode .....Record the 100 % color bars signal.  
PB mode .....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

1.45Vp-p REC mode



DM 1.45Vp-p REC mode



DM 715mVp-p REC mode



DTDM REC mode



EC mode



mVp-p REC mode



19 TP507 REC mode



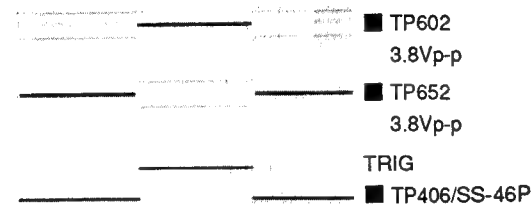
20 TP502 REC mode



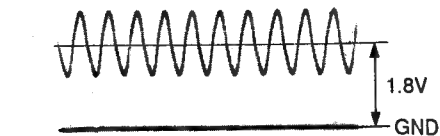
21 TP600 C-FM 440mVp-p REC mode



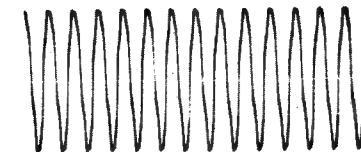
22 REC mode



23 TP401 PLL VCO REC mode



24 TP402 R-CK 6Vp-p REC mode



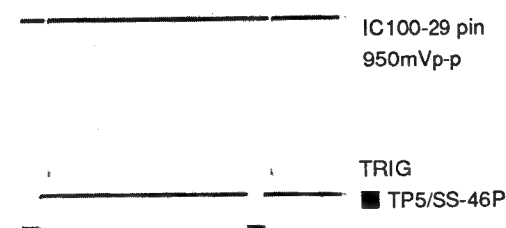
25 TP403 Y REF SYNC 5Vp-p REC mode



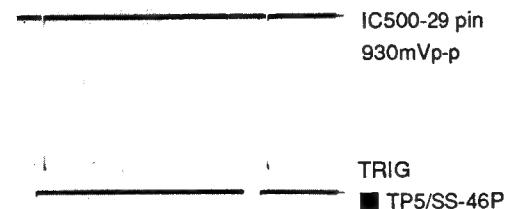
26 TP404 C REF SYNC 5Vp-p REC mode



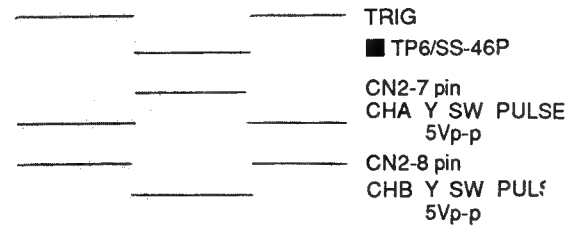
27 REC mode



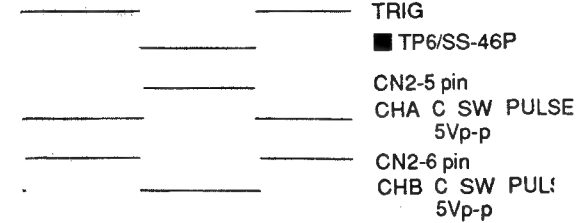
28 REC mode



29 REC mode



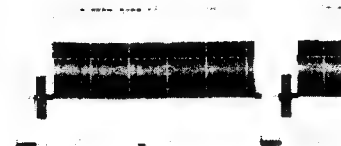
30 REC mode



31 CN2-3 pin CHARACTER VIDEO DIAG mode



32 TP851 680mVp-p DIAG mode



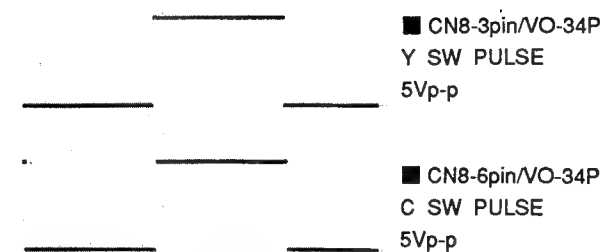
33 IC560-4 pin AFM PILOT 5Vp-p REC mode



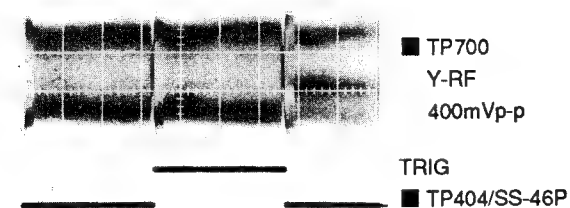
34 IC561-4 pin AFM PILOT 5Vp-p REC mode



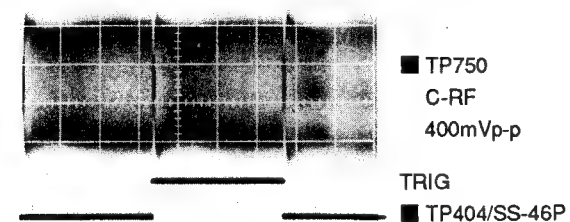
① PB mode



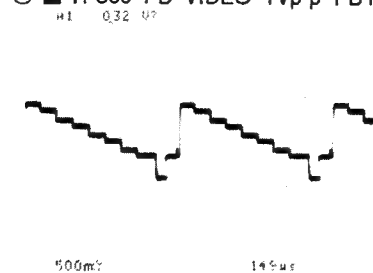
② PB mode



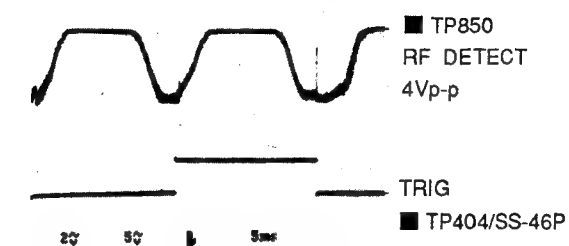
③ PB mode



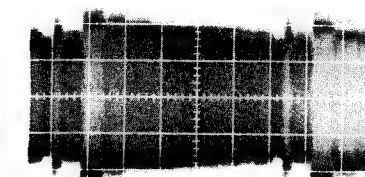
④ ■ TP800 PB VIDEO 1Vp-p PB mode



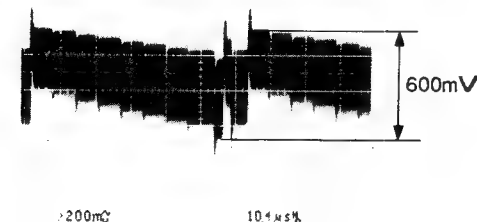
⑤ REC PAUSE mode



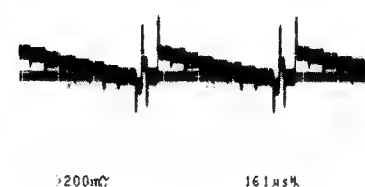
⑥ IC801-48 pin PB RF 150mVp-p PB mode



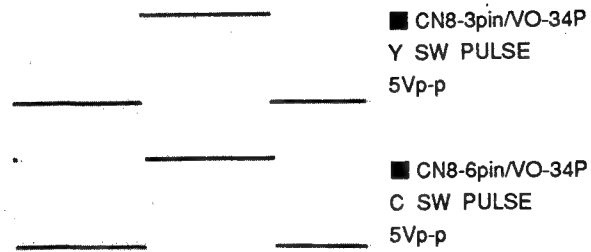
⑦ IC801-12 pin DEMOD OUTPUT PB mode



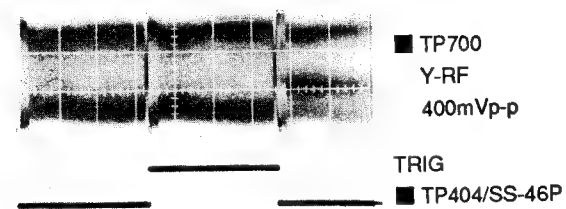
⑧ IC801-40 pin 700mVp-p PB mode



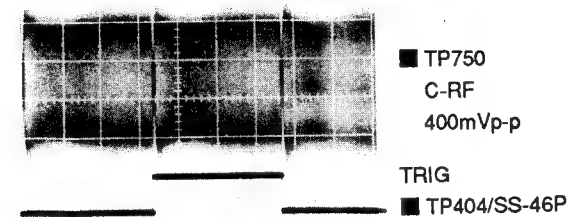
① PB mode



② PB mode



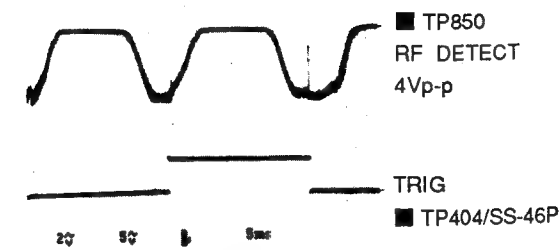
③ PB mode



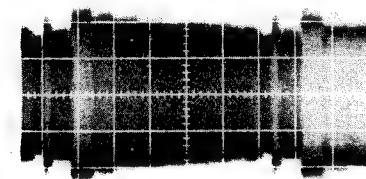
④ ■ TP800 PB VIDEO 1Vp-p PB mode



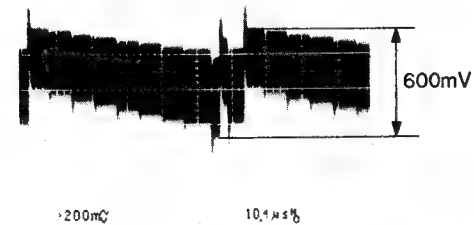
⑤ REC PAUSE mode



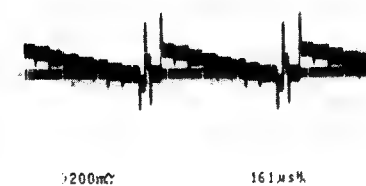
⑥ IC801-48 pin PB RF 150mVp-p PB mode



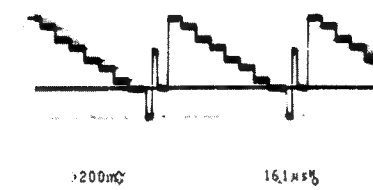
⑦ IC801-12 pin DEMOD OUTPUT PB mode



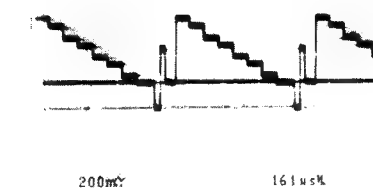
⑧ IC801-40 pin 700mVp-p PB mode



⑨ IC801-35 pin 750mVp-p PB mode



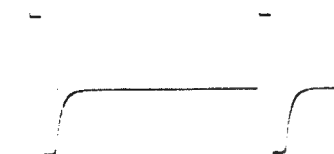
⑩ IC801-37 pin 500mVp-p PB mode



⑪ IC801-5 pin CLAMP PULSE 2Vp-p PB mode

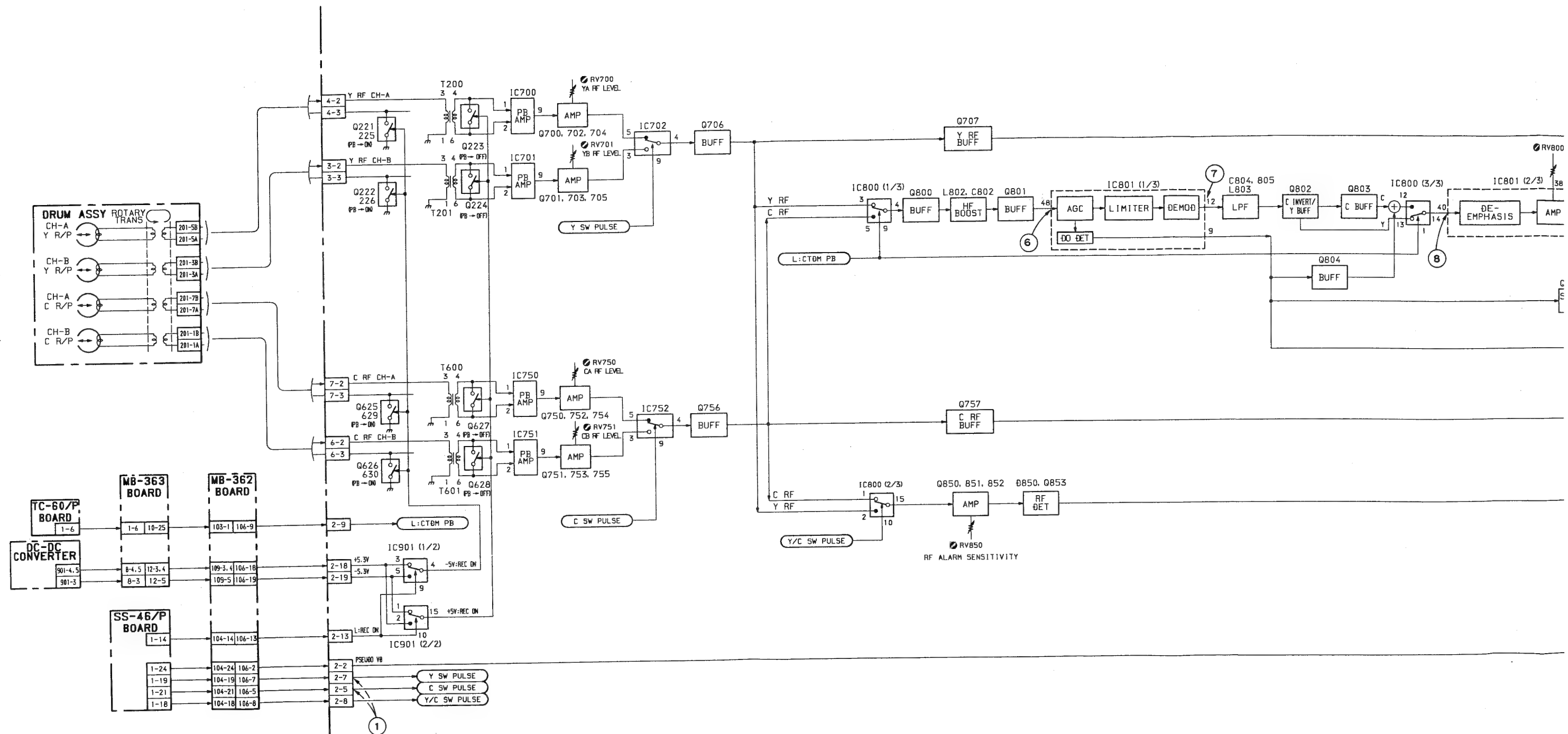


⑫ IC801-6 pin 5.5Vp-p PB mode



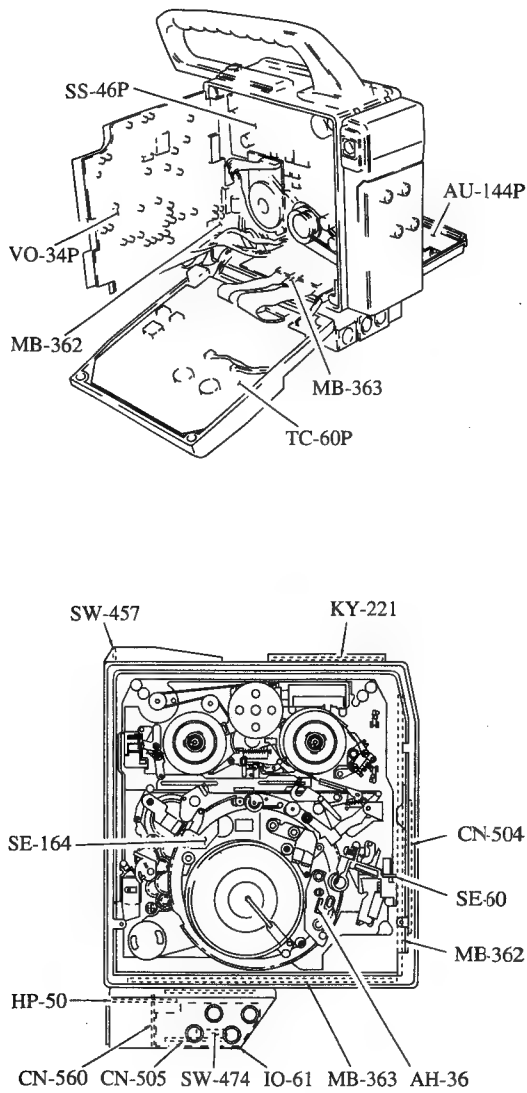
REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

VIDEO (2/2) BLOCK DIAGRAM  
Video PB  
RF Detect



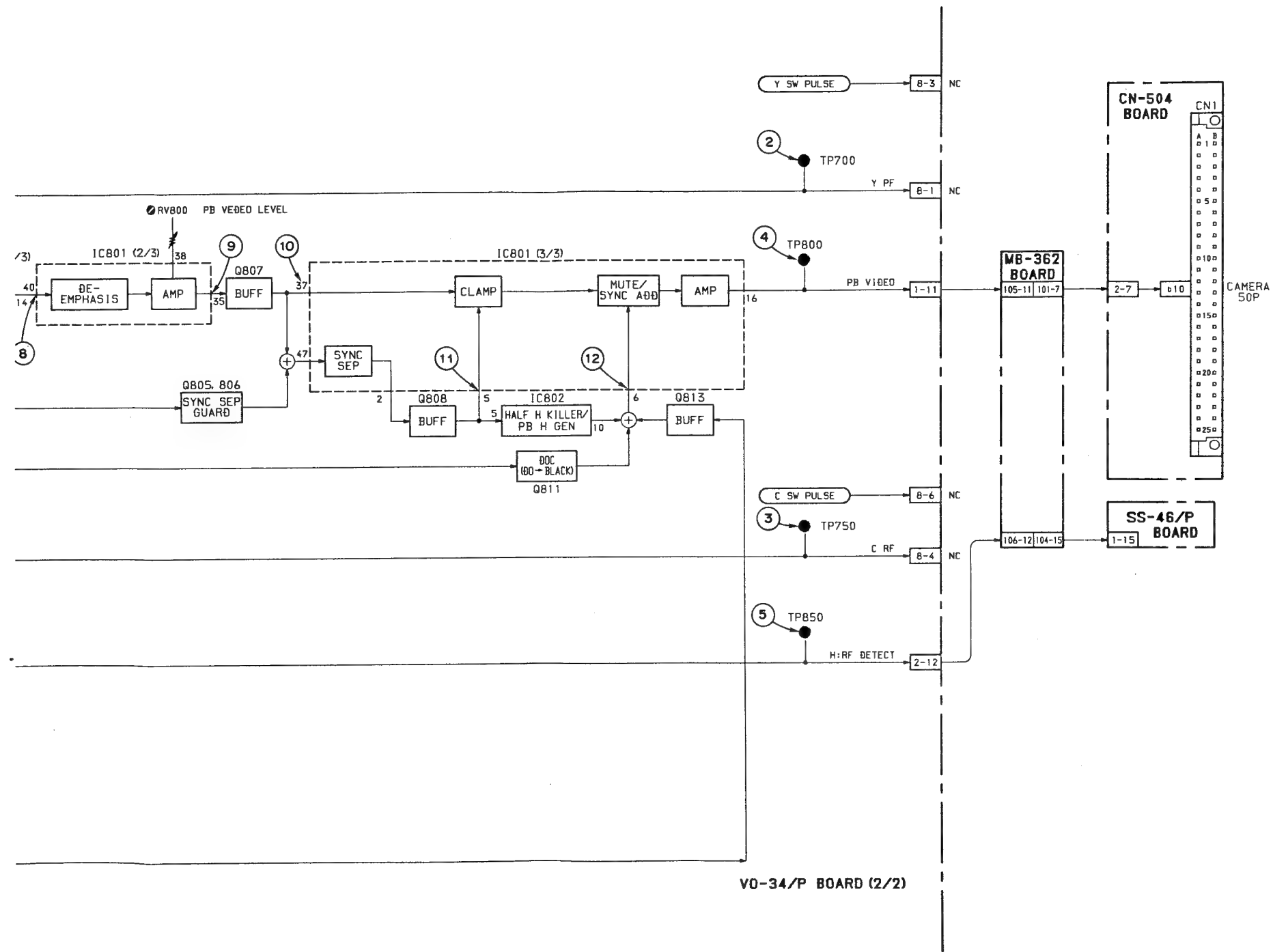


Location of the Printed Circuit Boards



VO-34/P BOARD (2/2)

REF NO.	ADDRESS
CN1	F-2
CN2	F-4
CN3	D-5
CN4	D-5
CN6	B-5
CN7	B-5
CN8	D-3
IC700	D-5
IC701	D-5
IC702	D-4
IC750	B-5
IC751	B-5
IC752	B-4
IC800	D-3
IC801	E-2
IC802	E-2
IC901	F-3
RV700	D-4
RV701	D-4
RV750	B-4
RV751	B-4
RV800	D-2
RV850	E-4
TP700	E-3
TP750	C-4
TP800	F-2
TP850	F-4



VO-34/P BOARD.....11-2 PAGE

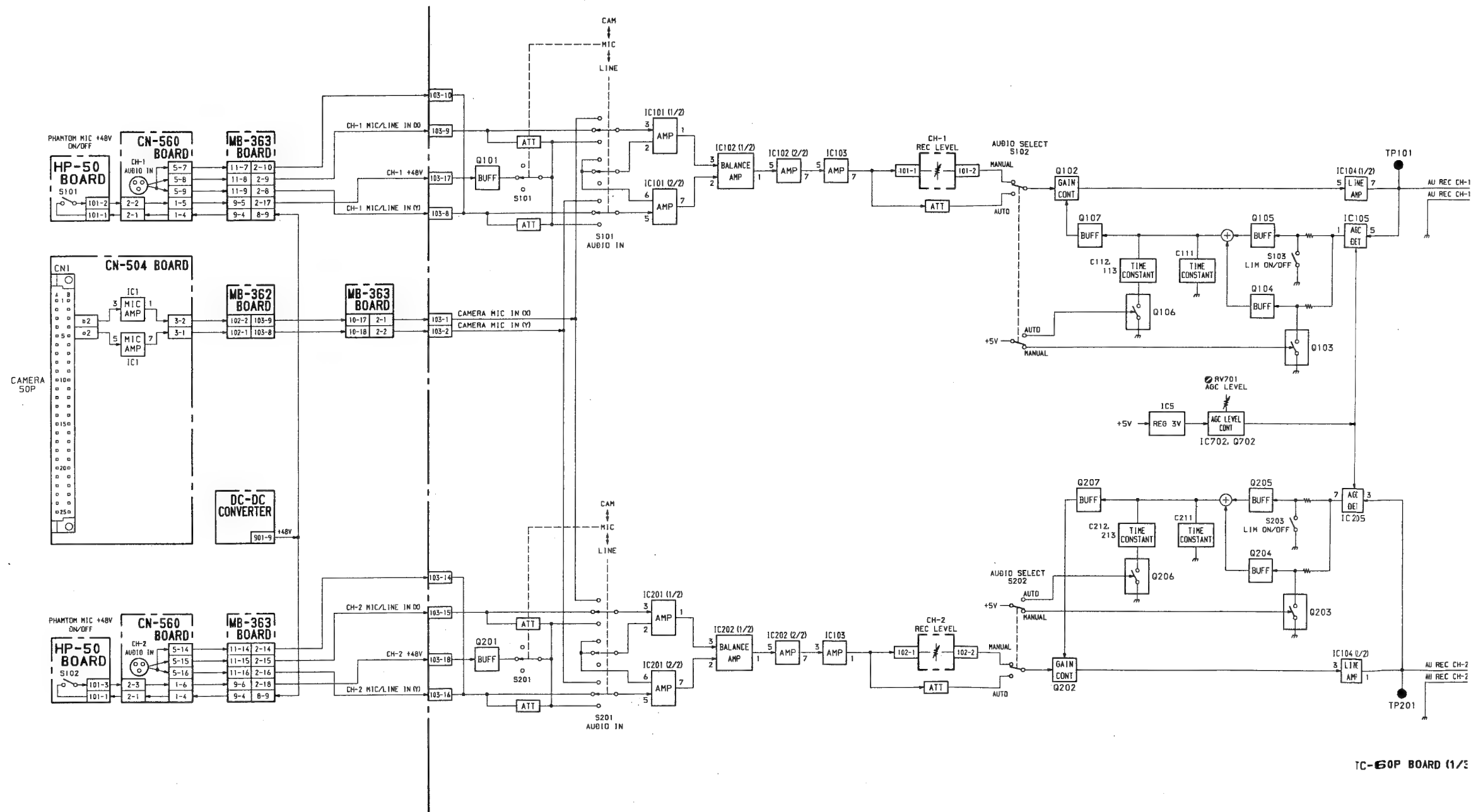
VIDEO (2/2) BLOCK DIAGRAM

PVV-1 (J) : #10001-  
PVV-1 (UC) : #10001-  
PVV-1P (EK) : #10001-

AUDIO (1/2) BLOCK DIAGRAM  
Audio REC/PB

AU-144P BOARD		TC-60P BOARD (1/3)	
REF NO.	ADDRESS	REF NO.	ADDRESS
CN1	A-2	CN101	C-4 (B)
CN2	G-2	CN102	B-4 (B)
CN4	B-1	CN103	B-7 (B)
CN5	G-1	IC5	F-3
CN6	D-1	IC101	B-6 (B)
CV131	F-1	IC102	B-6 (B)
CV231	F-1	IC103	B-5 (B)
IC1	G-2	IC104	B-4 (B)
IC2	C-2	IC105	B-5 (B)
IC111	F-2	IC201	B-6 (B)
IC112	F-2	IC202	A-6 (B)
IC301	D-1	IC205	A-5 (B)
IC302	C-1	IC702	E-5 (B)
IC303	B-1	RV701	E-5 (B)
IC501	A-2	TP101	C-4 (B)
IC502	A-2	TP201	B-4 (B)
IC503	B-2		
IC504	A-2		
IC602	A-2		
IC603	A-2		
LV111	F-2		
LV131	F-1		
LV211	G-2		
LV231	F-1		
RV101	B-2		
RV111	F-2		
RV112	F-2		
RV113	F-2		
RV201	B-2		
RV211	F-2		
RV212	G-2		
RV302	C-1		
RV303	C-1		
RV402	C-1		
RV403	C-1		
TP101	E-2		
TP102	F-2		
TP201	F-2		
TP202	F-2		
TP301	D-1		
TP302	D-1		
TP303	A-2		
TP401	D-1		
TP402	D-1		
TP403	A-1		

--- : ---A SIDE  
---(B): ---B SIDE

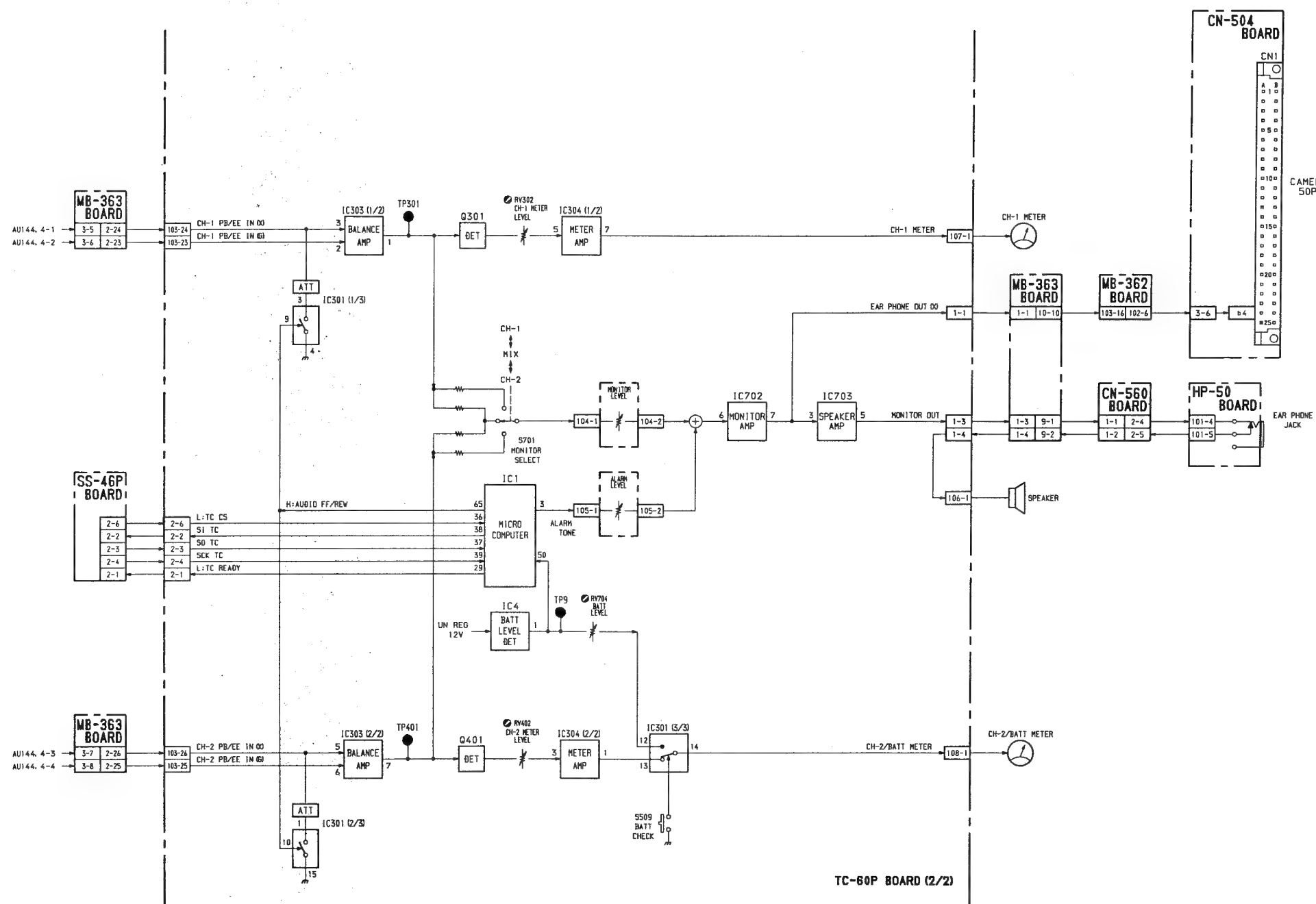


TC-60P BOARD (1/3)

**AUDIO (1/2) BLOCK DIAGRAM**



AUDIO (2/2) BLOCK DIAGRAM  
Audio Meter/Monitor AMP



TC-60P BOARD (2/3)

REF NO.	ADDRESS
CN1	D-7 (B)
CN2	E-7 (B)
CN103	B-7 (B)
CN104	G-4 (B)
CN105	G-4 (B)
CN106	G-3 (B)
CN107	C-1 (B)
CN108	B-1 (B)
IC1	F-4
IC4	F-3 (B)
IC301	B-1
IC303	A-3 (B)
IC304	B-2 (B)
IC702	E-5 (B)
IC703	E-5 (B)
RV302	C-1
RV402	B-1
RV704	A-1
TP9	F-3 (B)
TP301	A-3 (B)
TP401	A-3 (B)

---A SIDE  
---(B); ---B SIDE

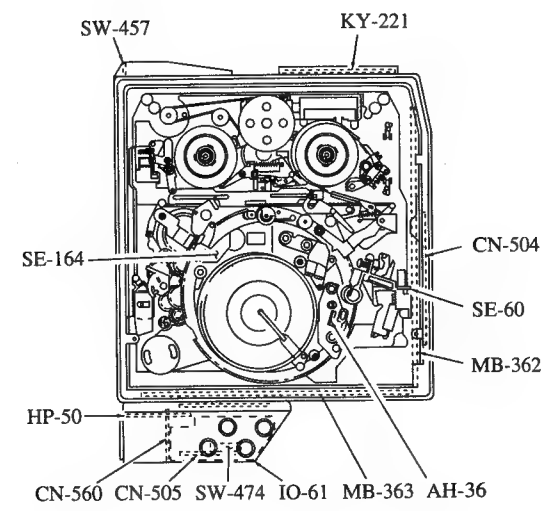
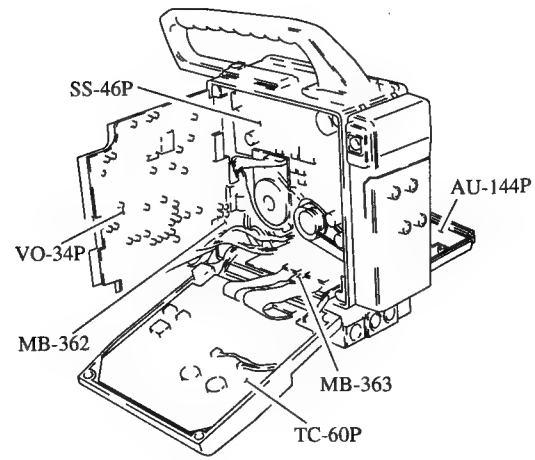
TC-60P BOARD.....11-14 PAGE

AUDIO (2/2) BLOCK DIAGRAM

PVV-1P (EK) : #10001-

Location of the Printed Circuit Boards

RD (2/3)
ADDRESS
D-7 (B)
E-7 (B)
B-7 (B)
G-4 (B)
G-4 (B)
G-3 (B)
C-1 (B)
B-1 (B)
F-4
F-3 (B)
B-1
A-3 (B)
B-2 (B)
E-5 (B)
E-5 (B)
C-1
B-1
A-1
F-3 (B)
A-3 (B)
A-3 (B)



# SYSTEM CONTROL BLOCK DIAGRAM

## SYSTEM CONTROL BLOCK DIAGRAM

### System Control

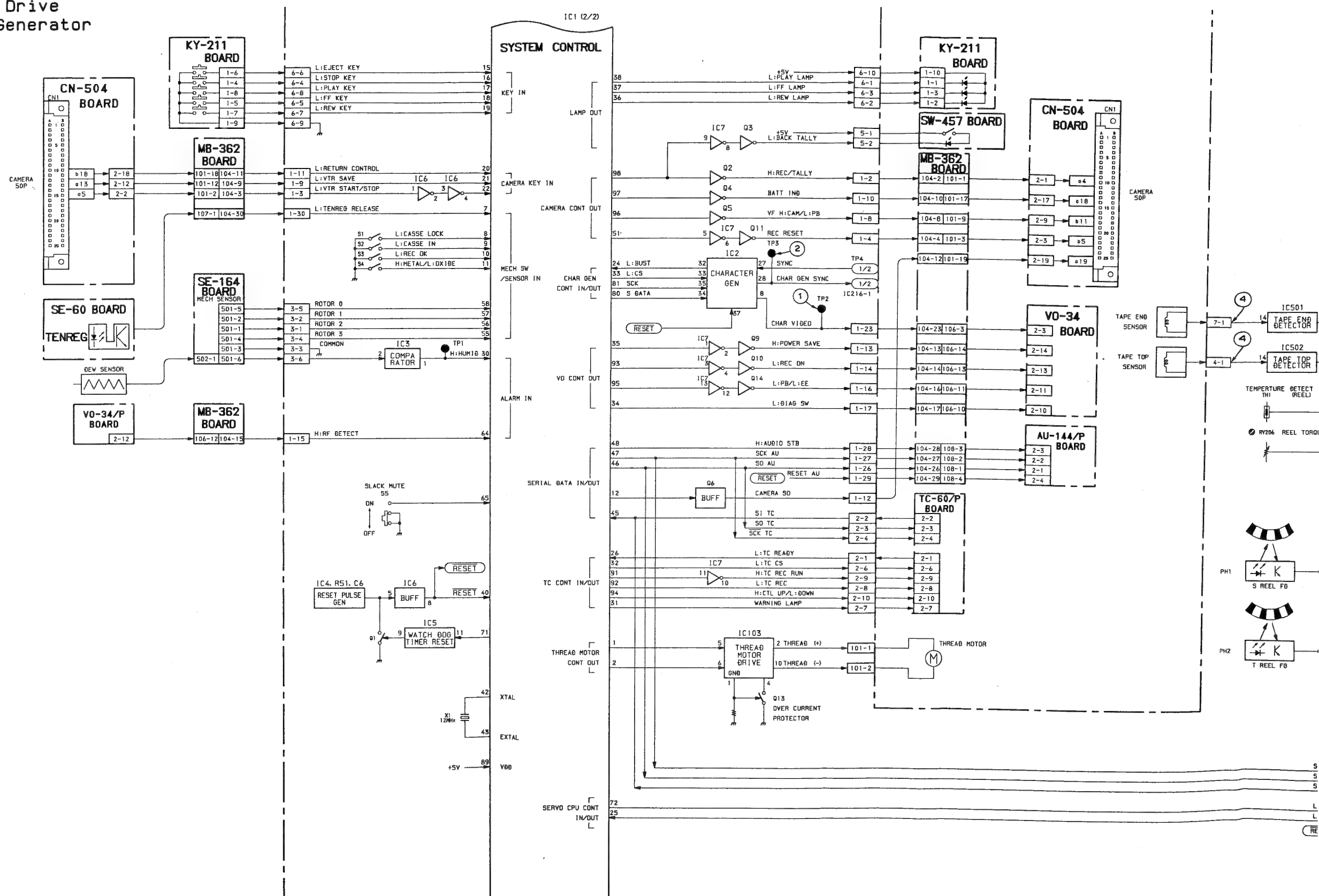
### Reel Motor Drive

### Character Generator

SS-46/P BOARD (2/2)

REF NO.	ADDRESS
CN1	A-1 (B)
CN2	B-3
CN3	F-4
CN4	F-3
CN5	F-2
CN6	C-1
CN7	A-3
CN101	F-6
CN102	A-3
CN103	A-1
CN205	E-2
IC1	B-1
IC2	D-3
IC3	F-4
IC4	C-3
IC5	C-3
IC6	C-3
IC7	B-3
IC16	C-3
IC103	F-5
IC201	C-1
IC213	F-5
IC217	F-5
IC218	F-3
IC501	A-3
IC502	F-3
RV206	D-5 (B)
TP1	E-3
TP2	D-3
TP3	D-3
TP103	F-3
TP204	D-2
TP205	D-2
TP210	E-5
X1	C-1
X201	E-2

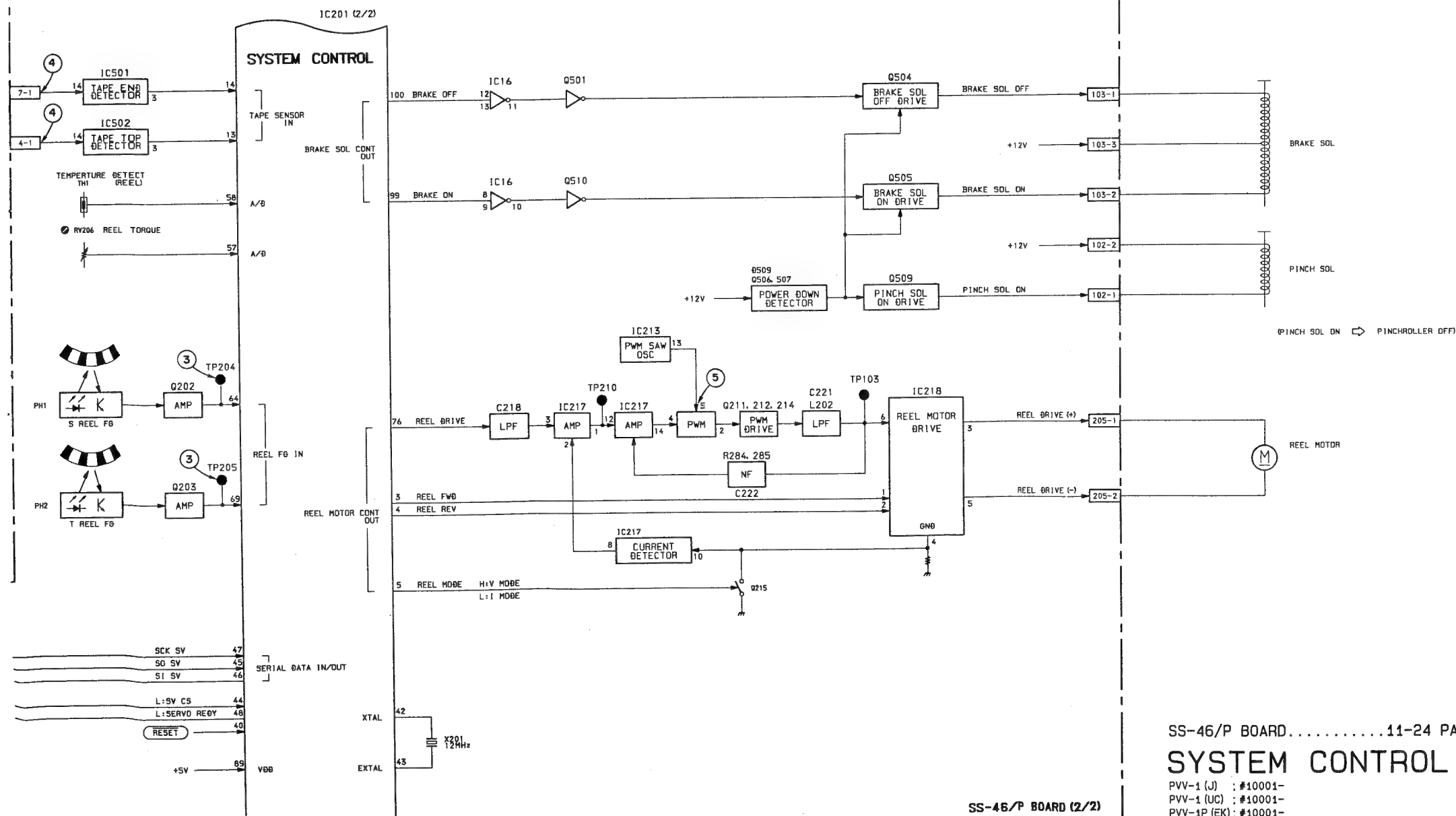
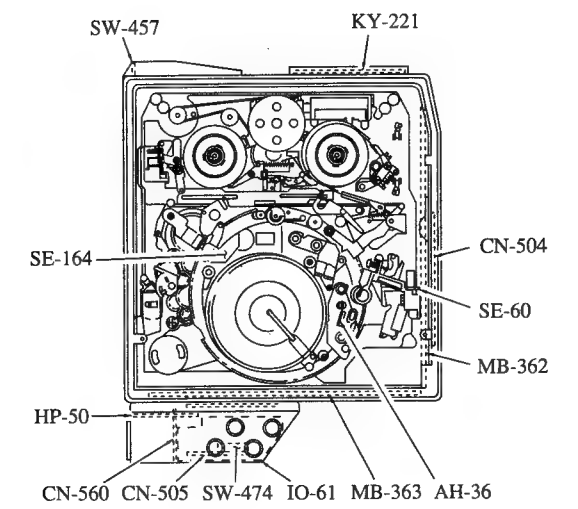
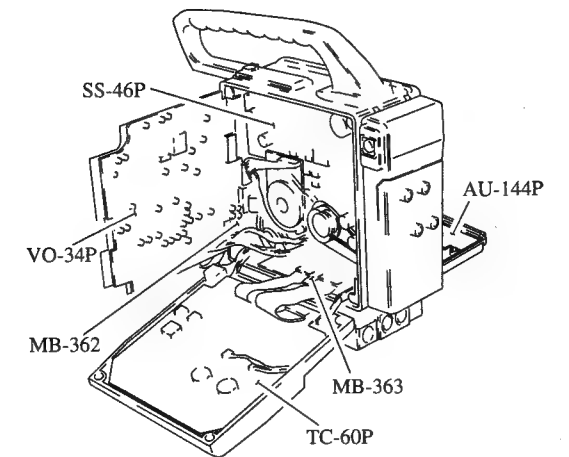
---A SIDE  
---(B)---B SIDE



# SYSTEM CONTROL BLOCK DIAGRAM

# SYSTEM CONTROL BLOCK DIAGRAM

## Location of the Printed Circuit Boards



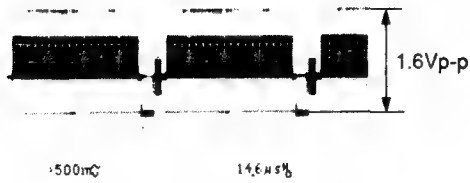
SS-46/P BOARD.....11-24 PAGE

## SYSTEM CONTROL BLOCK DIAGRAM

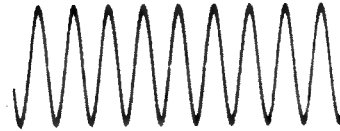
PVV-1 (J) : #10001-  
 PVV-1 (UC) : #10001-  
 PVV-1P (EK) : #10001-

SS-46/P BOARD (2/2)

① ■ TP2 CHAR VIDEO DIAG mode



④ CN4-1 pin/CN7-1 pin 180mVp-p PB mode



② ■ TP3 CHAR GEN SYNC 5.5Vp-p STANDBY mode



⑤ IC213-5,7,9 PWM SAW 1.5Vp-p



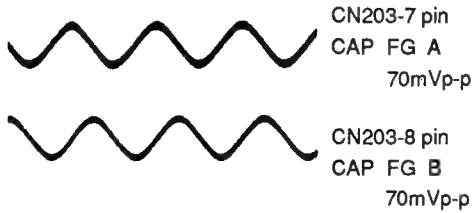
③ ■ TP204 S REEL FG 5.3Vp-p FF/REW mode  
■ TP205 T REEL FG 5.3Vp-p FF/REW mode



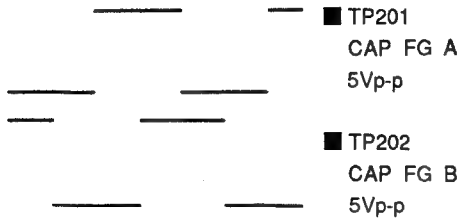


# SERVO BLOCK DIAGRAM

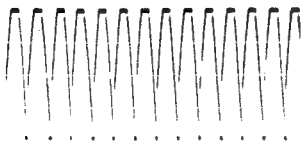
① REC mode



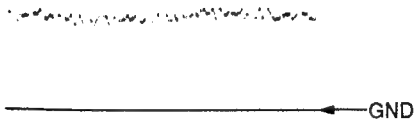
② REC mode



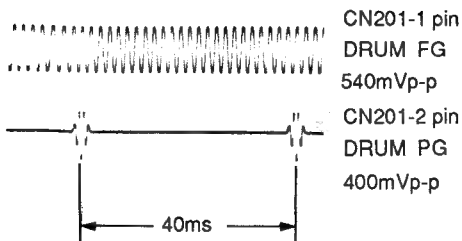
③ ■ TP203 CAP STOP SERVO ERROR REC mode



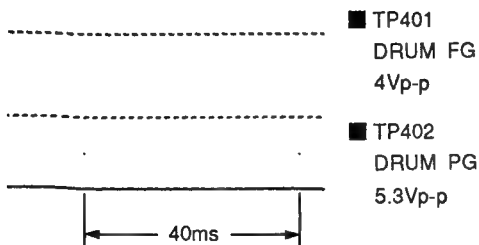
④ ■ TP209 CAP DRIVE 3.5Vdc REC mode



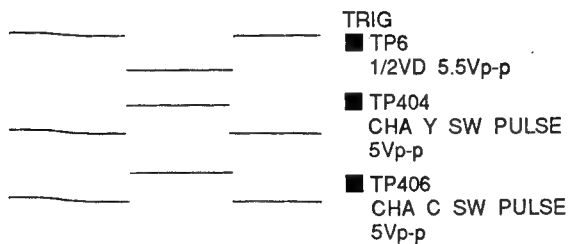
⑤ REC mode



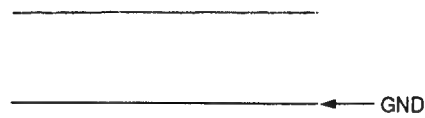
⑥ REC mode



⑦ REC mode



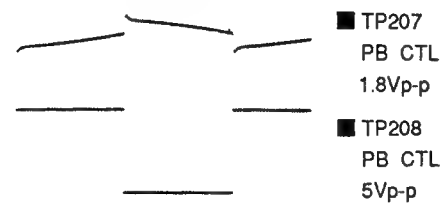
⑧ ■ TP403 DRUM DRIVE 6.0Vdc REC mode



⑨ ■ TP206 REC CTL 40mVp-p REC mode



⑩ PB mode



⑪ ■ TP4 COMP SYNC 5Vp-p REC mode



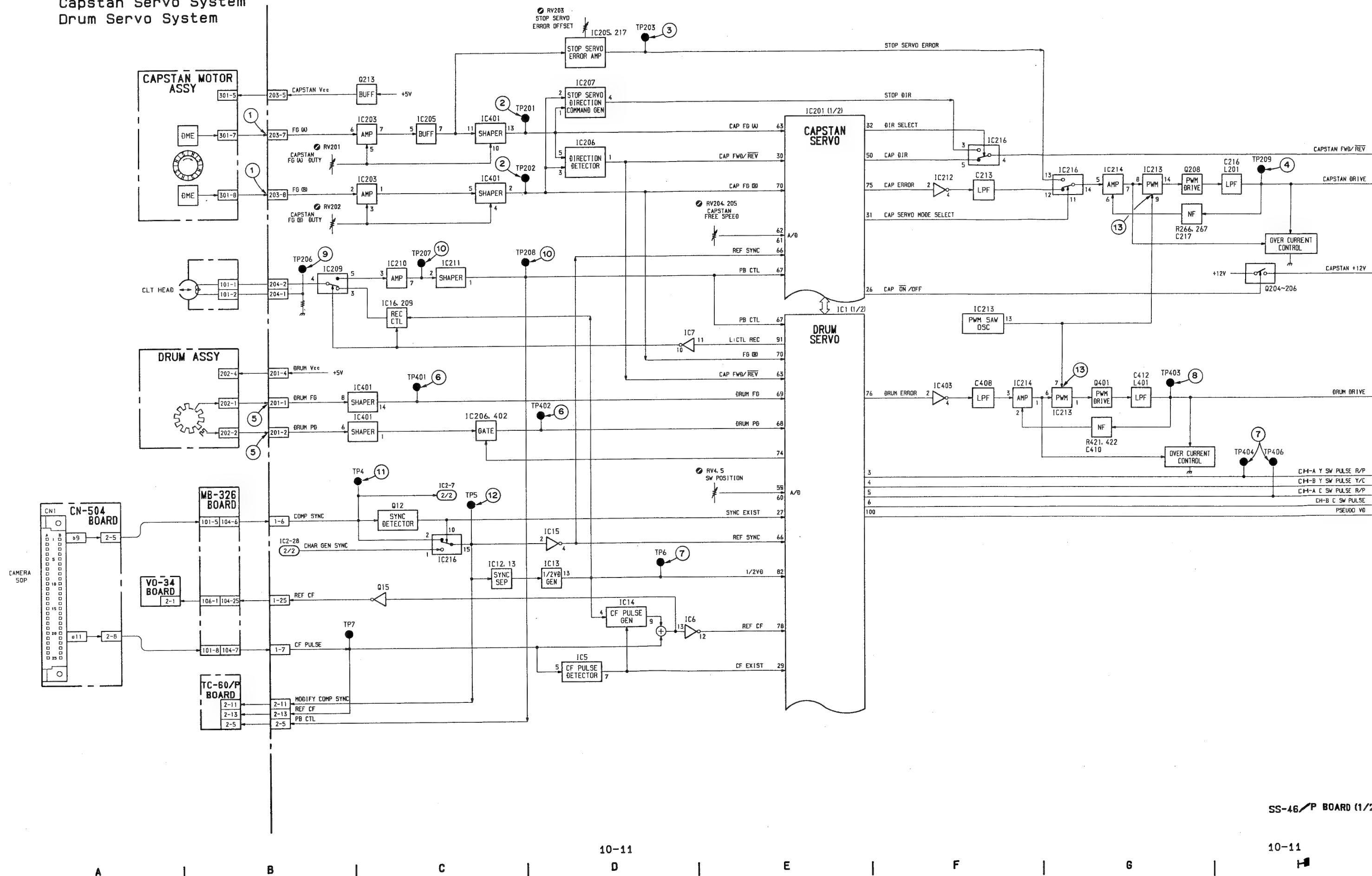
⑫ ■ TP5 REF SYNC 5Vp-p REC mode



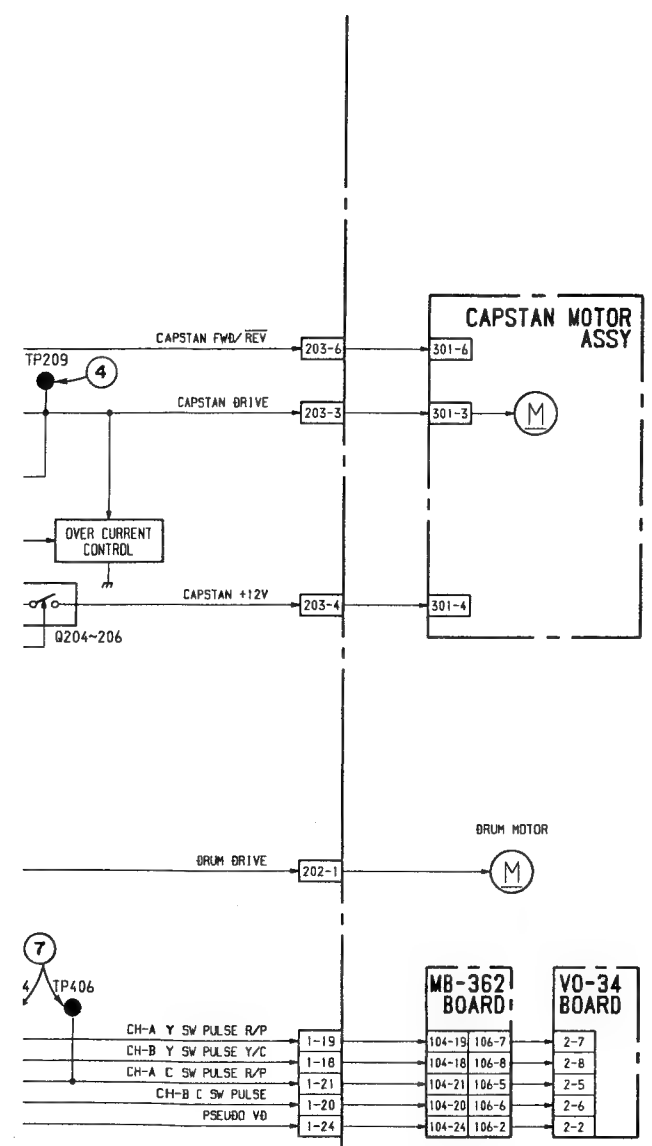
⑬ IC213-5,7,9 PWM SAW 1.5Vp-p



**SERVO BLOCK DIAGRAM**  
Capstan Servo System  
Drum Servo System



SERVO BLOCK DIAGRAM      SERVO BLOCK DIAGRAM



SS-46/P BOARD.....11-24 PAGE

SERVO BLOCK DIAGRAM

PVV-1 (J) : #10001-  
PVV-1 (UC) : #10001-  
PVV-1P (EK) : #10001-

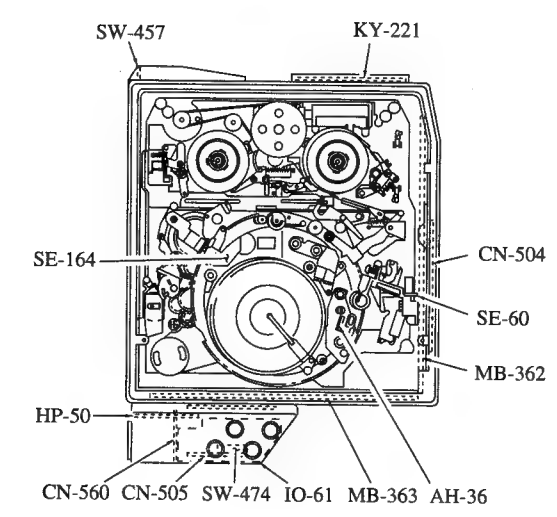
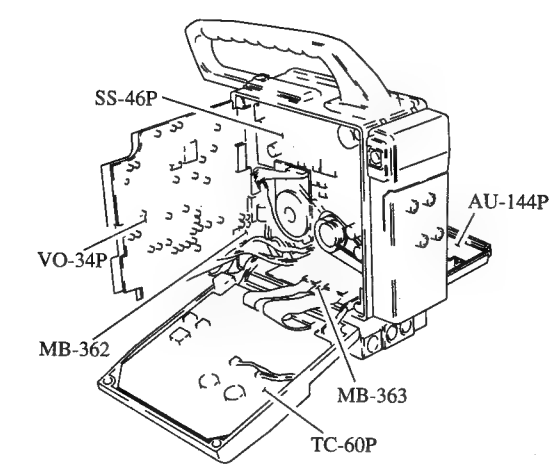
SS-46/P BOARD (1/2)

SS-46/P BOARD (1/2)

REF NO.	ADDRESS
CN1	A-1 (B)
CN2	B-3
CN201	E-5
CN202	F-6
CN203	D-5
CN204	A-4
IC1	B-1
IC5	C-3
IC6	C-3
IC7	B-3
IC12	C-4
IC13	D-4
IC14	D-4
IC15	C-1
IC16	C-3
IC201	C-1
IC203	C-5
IC205	D-5
IC206	E-4
IC207	F-4
IC209	B-3
IC210	B-3
IC211	B-3
IC212	E-2
IC213	F-5
IC214	F-5
IC216	F-4
IC217	F-5
IC401	E-4
IC402	D-3
IC403	B-2
RV4	C-1
RV5	C-1
RV201	D-4
RV202	D-4
RV203	E-4
RV204	C-1
RV205	C-2
TP4	A-1
TP5	D-2
TP6	D-4
TP7	A-2
TP201	E-4
TP202	D-4
TP203	E-4
TP206	A-4
TP207	C-4
TP208	C-4
TP209	E-5
TP401	E-3
TP402	E-3
TP403	F-5
TP404	A-3
TP406	B-3

--A SIDE  
--(B); --B SIDE

Location of the Printed Circuit Boards



10-11

H

I

J

K

10-11

L

M

N

O

10-11

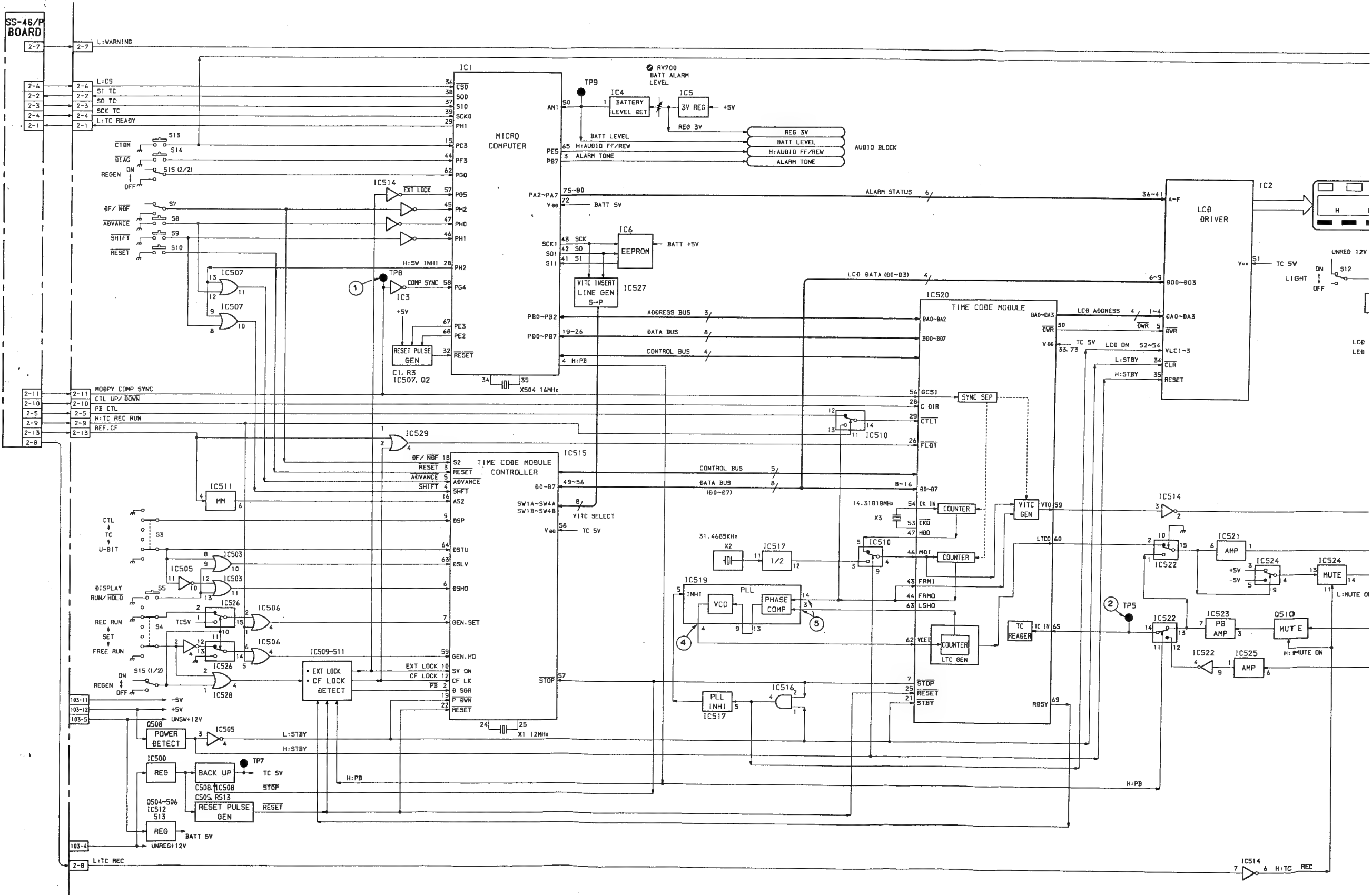
TIME CODE BLOCK DIAGRAM  
Time Code REC/PB  
LCD Display  
Battery Level Detect

TIME CODE BLOCK DIAGRAM TIME CODE BLOCK DIAGRAM

TC-60/P BOARD (3/3)

REF NO.	ADDRESS
CN1	D-7 (B)
CN2	E-7 (B)
CN103	B-7 (B)
IC1	F-4
IC2	F-1
IC3	G-5
IC4	F-3 (B)
IC5	F-3
IC6	E-4
IC500	C-5
IC503	D-4
IC505	D-4
IC506	D-5
IC507	D-6
IC508	C-5
IC509	G-6
IC510	E-5
IC511	F-6
IC512	F-7 (B)
IC513	F-7
IC514	E-6
IC515	D-1
IC516	E-4
IC517	D-4
IC519	E-2 (B)
IC520	G-2
IC521	D-5 (B)
IC522	F-6
IC523	E-7 (B)
IC524	D-5
IC525	E-7 (B)
IC526	D-6 (B)
IC527	D-1
IC528	D-7
IC529	G-6
RV700	F-3 (B)
TP5	F-6 (B)
TP7	C-4 (B)
TP8	G-5 (B)
TP9	F-3 (B)
X1	D-1
X2	D-4
X3	F-2
X504	F-4

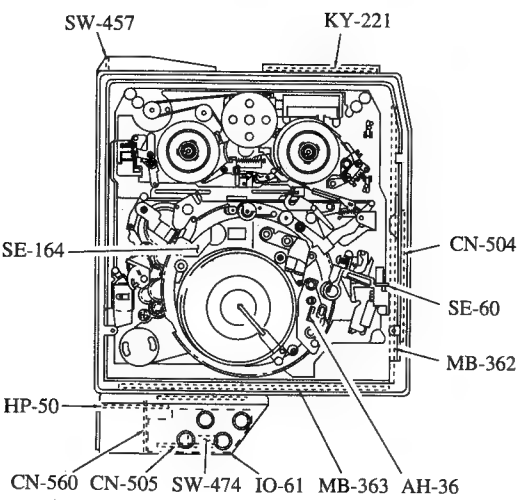
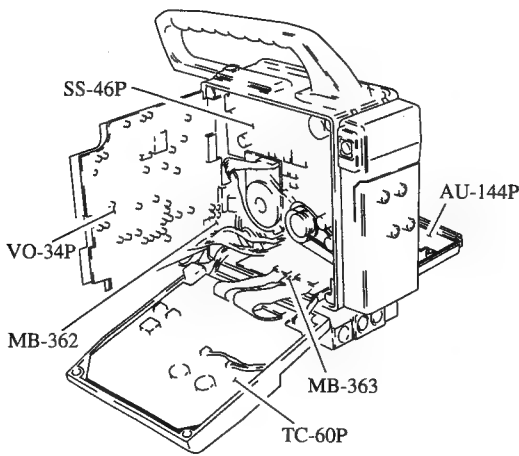
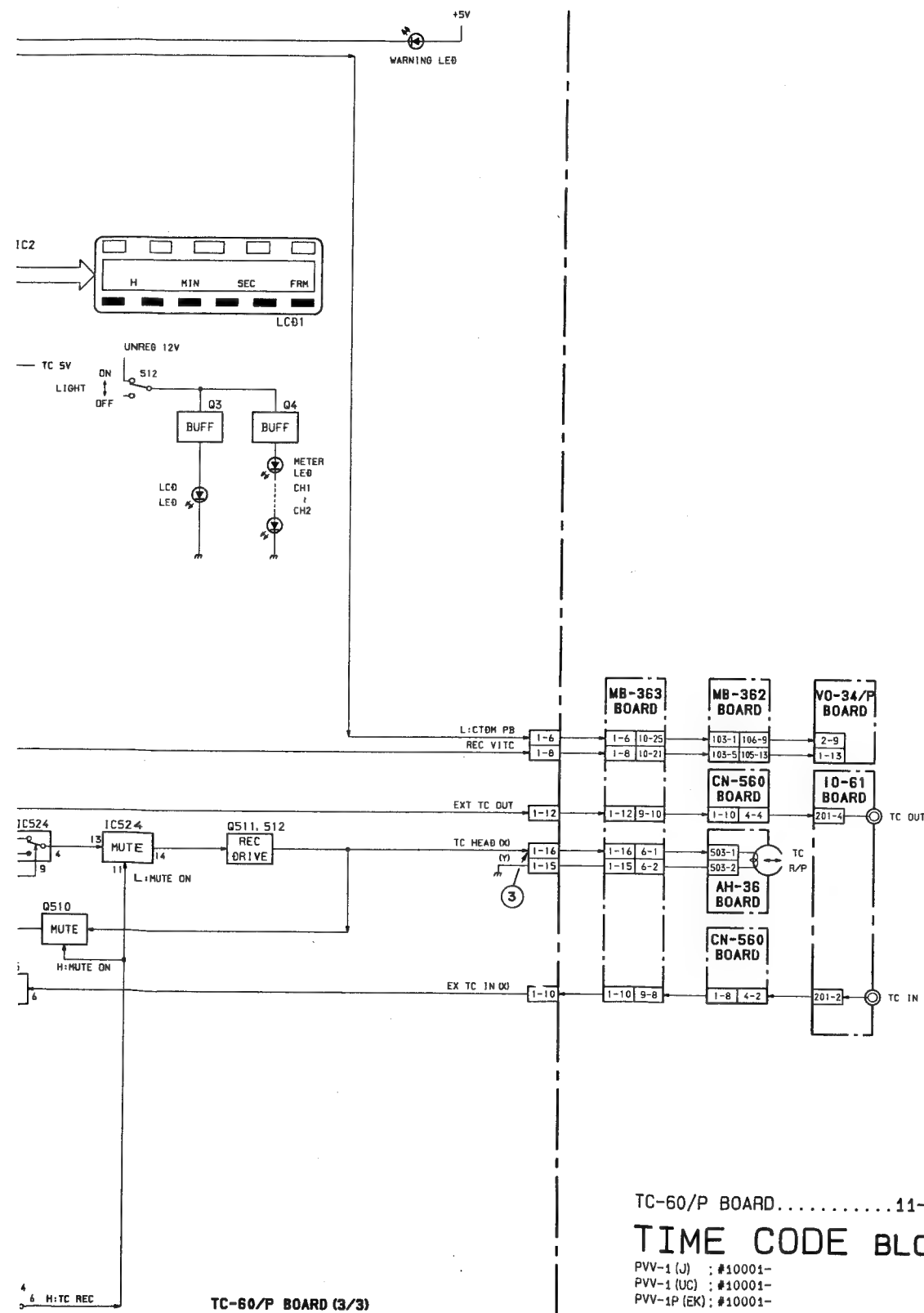
---A SIDE  
---(B)---B SIDE



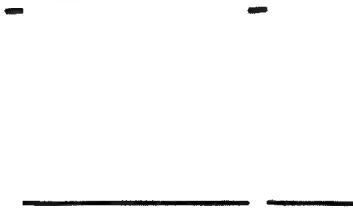
TIME CODE BLOCK DIAGRAM

TIME CODE BLOCK DIAGRAM

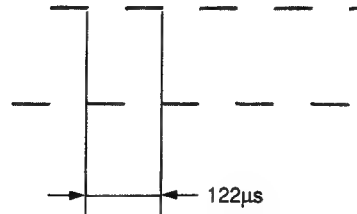
Location of the Printed Circuit Boards



① ■ TP8 COMP SYNC 5.5Vp-p REC mode



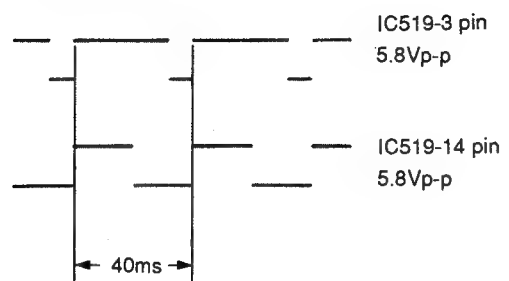
④ IC519-4 pin 6Vp-p REC mode



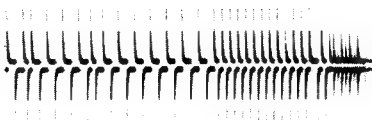
② ■ TP5 PB LTC 5Vp-p PB mode



⑤ REC mode



③ CN1-16 pin REC LTC 16Vp-p REC mode



SECTION 11  
SCHEMATIC DIAGRAM AND BOARD LAYOUT

Board	Function	Page
A	AU-144P Audio REC/PB.....	11-12
C	CN-504 Mic Amp, Camera 50P Connector.....	11-20
	CN-505 DC Input Power/Breaker Relay.....	11-36
	CN-560 Audio XLR Connector.....	11-22
D	DUS-489 (Refer to AU-144P Board)	
	DUS-496 (Refer to SS-46P Board)	
	DUS-505 (Refer to SS-46P Board)	
	DUS-852 (Refer to SS-46P Board)	
H	HP-50 Earphone, Phantom ON/OFF Switch.....	11-36
I	IO-61 BNC Connector.....	11-36
K	KY-211 Function Key.....	11-34
M	MB-362 Mother Board.....	11-30
	MB-363 Mother Board.....	11-32
S	SE-60 Tension Regulator Sensor.....	11-34
	SE-164 Mechanical Sensor, DEW Sensor Relay.....	11-34
	SS-46P Servo System, System Control.....	11-24
	SW-457 Backtally Switch.....	11-34
	SW-474 Breaker.....	11-36
T	TC-60P Audio Line/Meter Amp, Time Code.....	11-14
V	VO-34P Video REC/PB.....	11-2

回路図内において、REF. NO の近傍に下記記号が記載されていますが、これは生産時の部品データである。

In the schematic diagrams, the following marks are described near by reference number.

These are parts data at factory.

CAPACITOR (C)

AL	}	ELECTROLYTIC
AS		
TA	}	TANTALUM
CA		
CC	}	CERAMIC
CCS		
CM		
CS		
MPS	}	MYLAR
PP		
PS		
PT		
MD	}	DIPPED MICA
MS		
		MICA

RESISTOR (R)

VARIABLE RESISTOR (RV)

RC	}	CARBON
RD		
RF	}	FUSE
RN		
RS	}	METAL
RW		
		WIERWOUND

VO-34P BOARD  
Video REC/PB

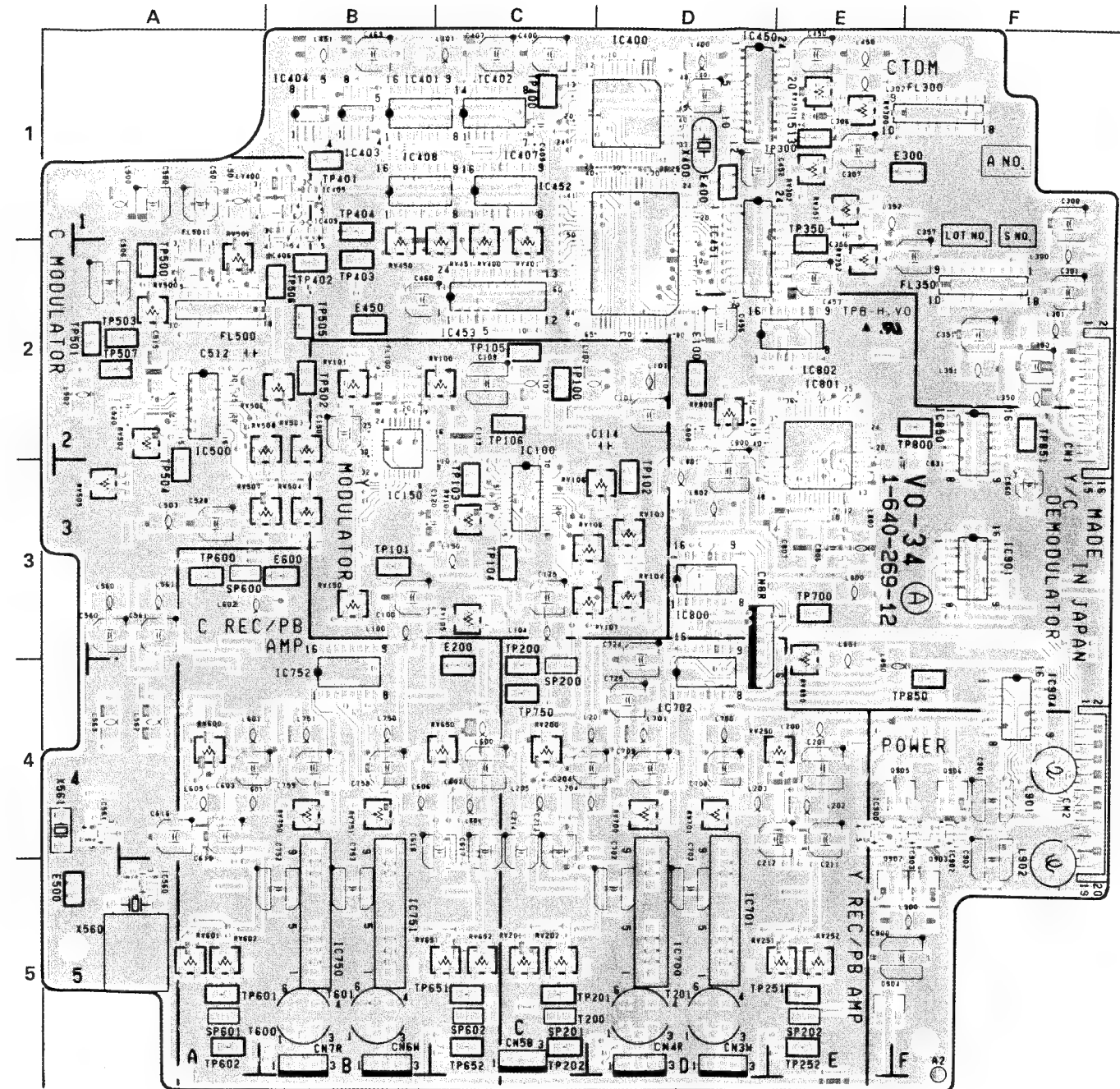
S/N 10001 through 10100

VO-34/P (1-640-269-12)

CN1	F-2	LV400	A-1	Q506	A-3 (B)	Q809	E-2 (B)	SP202	E-5
CN2	F-4			Q507	A-3 (B)	Q810	E-2 (B)	SP600	A-3
CN3	D-5	Q100	C-2 (B)	Q508	A-3 (B)	Q811	E-2 (B)	SP601	A-5
CN4	D-5	Q101	B-2 (B)	Q509	A-2 (B)	Q812	E-2 (B)	SP602	C-5
CN5	C-5	Q102	C-2 (B)	Q510	A-3 (B)	Q813	E-2 (B)		
CN6	B-5	Q103	C-2 (B)	Q511	A-3 (B)	Q850	E-3 (B)	SS200	C-4
CN7	B-5	Q104	B-3 (B)	Q560	A-4 (B)	Q851	E-4 (B)	SS201	C-5
CN8	D-3	Q105	B-3 (B)	Q561	A-4 (B)	Q852	E-4 (B)	SS202	E-5
		Q106	D-3 (B)	Q562	A-4 (B)	Q853	F-3 (B)	SS600	A-3
D400	B-1 (B)	Q107	C-3 (B)	Q563	A-4 (B)	Q900	F-4 (B)	SS601	A-5
D800	E-2 (B)	Q150	C-3 (B)	Q600	A-3 (B)	Q901	F-4 (B)	SS602	C-5
D801	E-2 (B)	Q151	B-3 (B)	Q601	B-3 (B)	Q902	E-5		
D850	F-4 (B)	Q152	C-3 (B)	Q602	A-3 (B)	Q903	F-4	TH400	C-1 (B)
D851	F-3 (B)	Q153	B-3 (B)	Q603	A-4 (B)	Q904	E-5		
D900	F-5 (B)	Q154	C-3 (B)	Q604	A-4 (B)	Q905	F-4	TP100	C-2
D901	F-4 (B)	Q155	C-3 (B)	Q605	A-4 (B)	Q906	F-4	TP101	B-3
D902	F-5 (B)	Q156	C-3 (B)	Q606	A-4 (B)			TP102	D-3
		Q200	C-4 (B)	Q607	C-4 (B)	RV100	C-2	TP103	C-3
E100	D-2	Q201	C-4 (B)	Q608	C-4 (B)	RV101	B-2	TP104	C-3
E200	C-4	Q202	E-4 (B)	Q609	A-4 (B)	RV102	C-3	TP105	C-2
E300	F-1	Q203	C-4 (B)	Q610	C-4 (B)	RV103	D-3	TP106	C-2
E400	D-1	Q204	E-4 (B)	Q611	A-4 (B)	RV104	D-3	TP200	C-3
E450	B-2	Q205	C-4 (B)	Q612	C-4 (B)	RV105	C-3	TP201	D-5
E500	A-5	Q206	E-4 (B)	Q613	A-4 (B)	RV106	C-3	TP202	C-5
E600	B-3	Q207	C-4 (B)	Q614	A-5 (B)	RV107	D-3	TP251	D-5
		Q208	E-4 (B)	Q615	C-4 (B)	RV108	C-3	TP252	E-5
FL100	B-2	Q209	C-4 (B)	Q616	C-5 (B)	RV150	B-3	TP300	E-1
FL300	F-1	Q210	C-5 (B)	Q617	B-5 (B)	RV200	C-4	TP350	E-1
FL350	F-2	Q211	E-4 (B)	Q618	A-5 (B)	RV201	C-5	TP400	C-1
FL500	A-2	Q212	E-5 (B)	Q619	C-5 (B)	RV202	C-5	TP401	B-1
FL501	A-1	Q213	D-5 (B)	Q620	B-5 (B)	RV250	D-4	TP402	B-2
		Q214	C-5 (B)	Q621	A-5 (B)	RV251	D-5	TP403	B-2
IC100	C-2	Q215	E-5 (B)	Q622	A-5 (B)	RV252	E-5	TP404	B-1
IC150	B-3	Q216	E-5 (B)	Q623	C-5 (B)	RV300	E-1	TP500	A-2
IC400	D-1	Q217	E-5 (B)	Q624	B-5 (B)	RV301	E-1	TP501	A-2
IC401	B-1	Q218	E-5 (B)	Q625	B-5 (B)	RV302	E-1	TP502	B-2
IC402	C-1	Q219	D-5 (B)	Q626	C-5 (B)	RV351	E-1	TP503	A-2
IC403	B-1	Q220	C-5 (B)	Q627	B-5 (B)	RV352	E-2	TP504	A-3
IC404	B-1	Q221	D-5 (B)	Q628	B-5 (B)	RV400	C-2	TP505	B-2
IC405	B-1	Q222	E-5 (B)	Q629	B-5 (B)	RV401	C-2	TP506	B-2
IC406	B-2	Q223	D-5 (B)	Q630	B-5 (B)	RV450	B-2	TP507	A-2
IC407	C-1	Q224	D-5 (B)	Q700	D-4 (B)	RV451	C-2	TP600	A-3
IC408	B-1	Q225	D-5 (B)	Q701	D-4 (B)	RV500	A-2	TP601	A-5
IC409	B-1	Q226	D-5 (B)	Q702	D-4 (B)	RV501	A-1	TP602	A-5
IC450	D-1	Q300	F-1 (B)	Q703	D-4 (B)	RV502	A-2	TP651	C-5
IC451	D-2	Q301	F-1 (B)	Q704	D-4 (B)	RV503	B-2	TP652	C-5
IC452	C-1	Q302	E-1 (B)	Q705	D-4 (B)	RV504	B-3	TP700	E-3
IC453	C-2	Q303	E-1 (B)	Q706	D-4 (B)	RV505	A-3	TP750	C-4
IC500	A-2	Q304	E-1 (B)	Q707	D-4 (B)	RV506	A-2	TP800	F-2
IC560	A-5	Q305	E-1 (B)	Q750	B-4 (B)	RV507	A-3	TP850	F-4
IC561	A-4	Q306	E-1 (B)	Q751	B-4 (B)	RV508	B-2	TP851	F-2
IC700	D-5	Q350	F-2 (B)	Q752	B-4 (B)	RV600	A-4		
IC701	D-5	Q351	F-2 (B)	Q753	B-4 (B)	RV601	A-5	T200	D-5
IC702	D-4	Q352	F-2 (B)	Q754	B-4 (B)	RV602	A-5	T201	D-5
IC750	B-5	Q353	E-1 (B)	Q755	B-4 (B)	RV650	C-4	T600	A-5
IC751	B-5	Q354	E-1 (B)	Q756	B-4 (B)	RV651	B-5	T601	B-5
IC752	B-4	Q355	E-2 (B)	Q757	B-4 (B)	RV652	C-5		
IC800	D-3	Q356	E-2 (B)	Q800	D-3 (B)	RV700	D-4	X400	D-1
IC801	E-2	Q400	C-1 (B)	Q801	D-3 (B)	RV701	D-4	X560	A-5
IC802	E-2	Q401	C-1 (B)	Q802	E-3 (B)	RV750	B-4	X561	A-4
IC850	F-2	Q500	A-2 (B)	Q803	E-3 (B)	RV751	B-4		
IC900	E-4	Q501	A-2 (B)	Q804	E-3 (B)	RV800	D-2		
IC901	F-3	Q502	A-1 (B)	Q805	E-2 (B)	RV850	E-4		
IC902	F-4	Q503	A-2 (B)	Q806	E-2 (B)				
IC903	F-4	Q504	A-2 (B)	Q807	D-2 (B)	SP200	C-4		
IC904	F-4	Q505	A-2 (B)	Q808	E-2 (B)	SP201	C-5		

NOTE  
\*-\* : \*-A SIDE  
\*-(B); \*-B SIDE

A Side



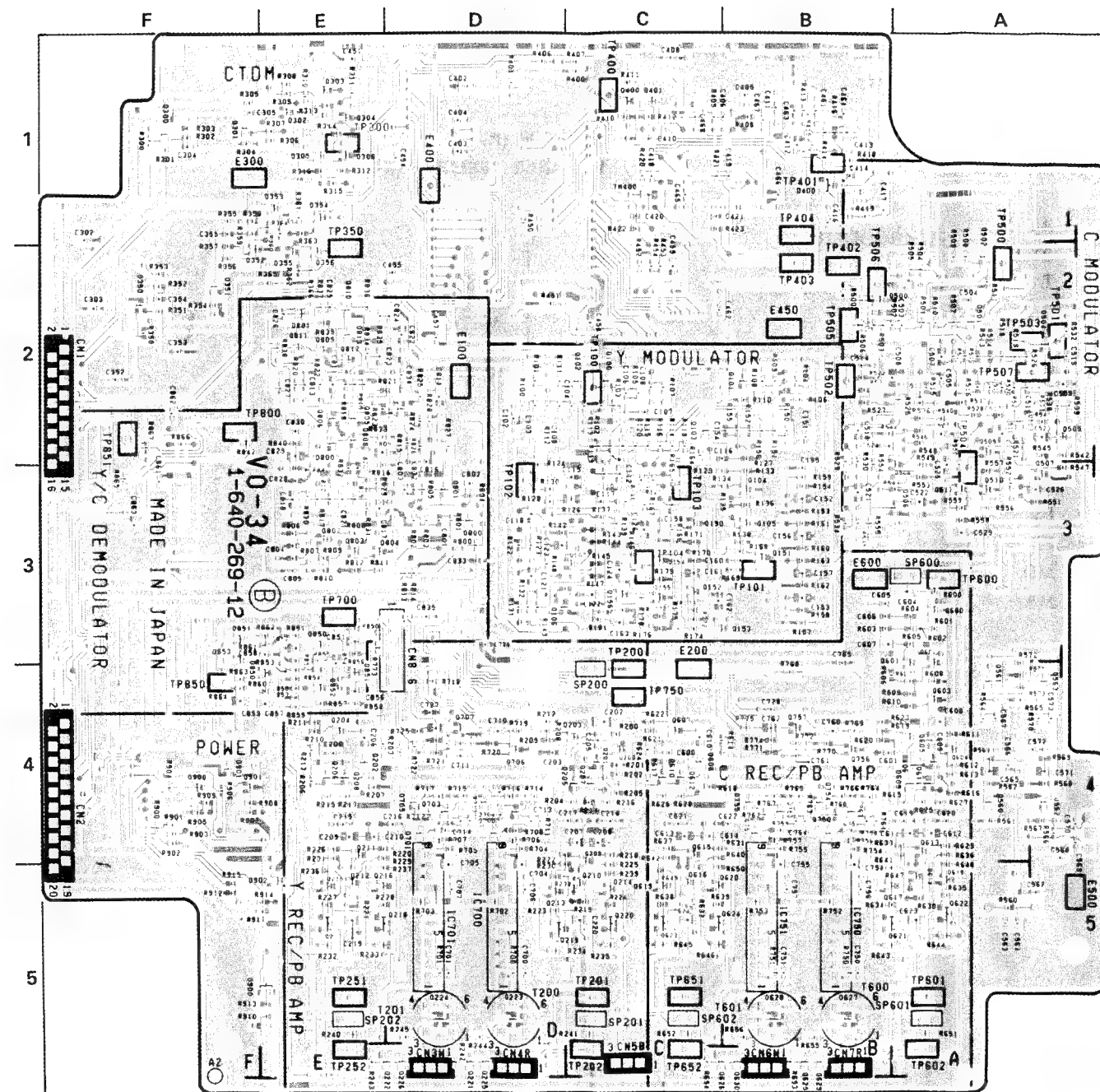
B Side



VO-34/P -A SIDE-  
1-640-269-12  
PVV-1-----VO-34  
PVV-1P-----VO-34P



B Side



V0-34/P -B SIDE-  
1-640-269-12  
PVV-1-----V0-34  
PVV-1P-----V0-34P

# V0-34P (1/5)

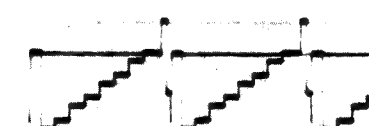
① TP100 Y 1Vp-p REC mode  
H4 4.15 V



② IC100-2 pin 1Vp-p REC mode  
H4 4.15 V



③ IC150-17 pin 1Vp-p REC mode  
H4 4.15 V



④ TP101 Y 1Vp-p REC mode  
H4 4.15 V



⑤ TP103 100mVp-p REC mode



⑥ IC100-5 pin 360mVp-p REC mode  
H4 4.15 V



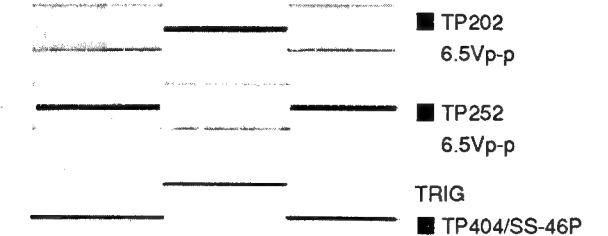
⑦ TP102 REC mode  
H4 4.15 V



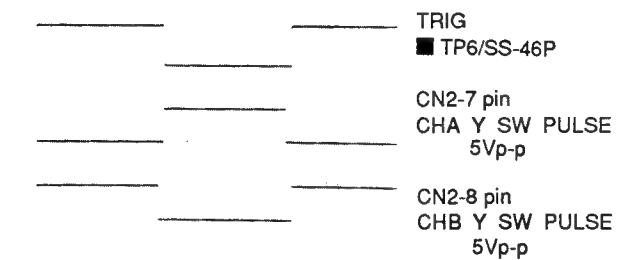
⑧ TP200 Y-FM 440mVp-p REC mode



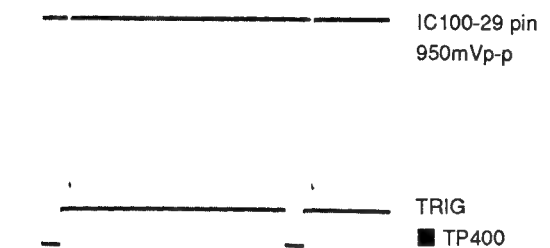
⑨ REC mode



⑩ REC mode



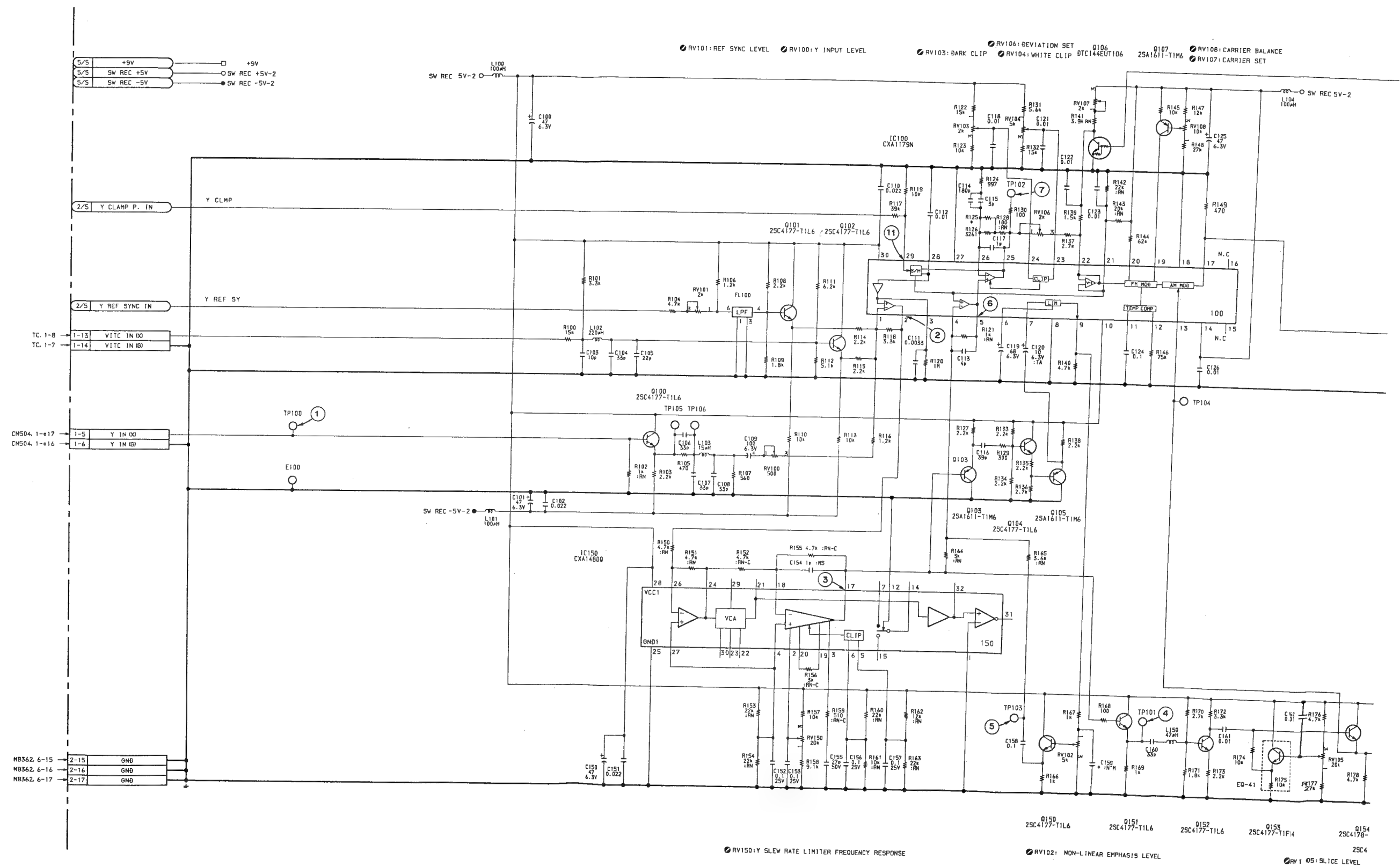
⑪ REC mode



REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

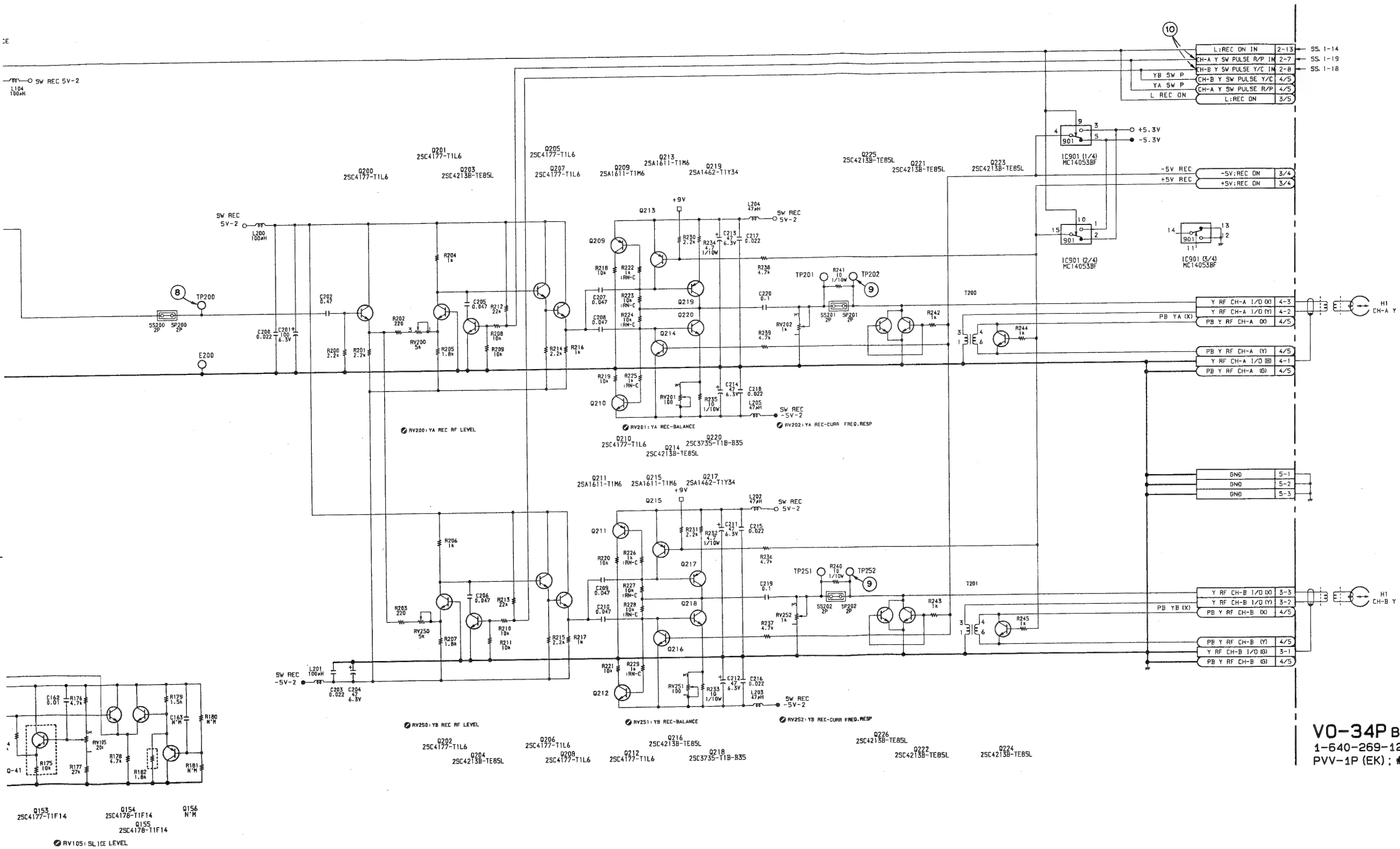
VO-34P BOARD (1/5)  
Y Modulator  
Y REC Amplifier

S/N 10001 through 10100



11-3 (a)

11-3 (a)



VO-34P BOARD (1/5)  
1-640-269-12  
PVV-1P (EK); #10001-10100

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VO-34P BOARD  
Video REC/PB

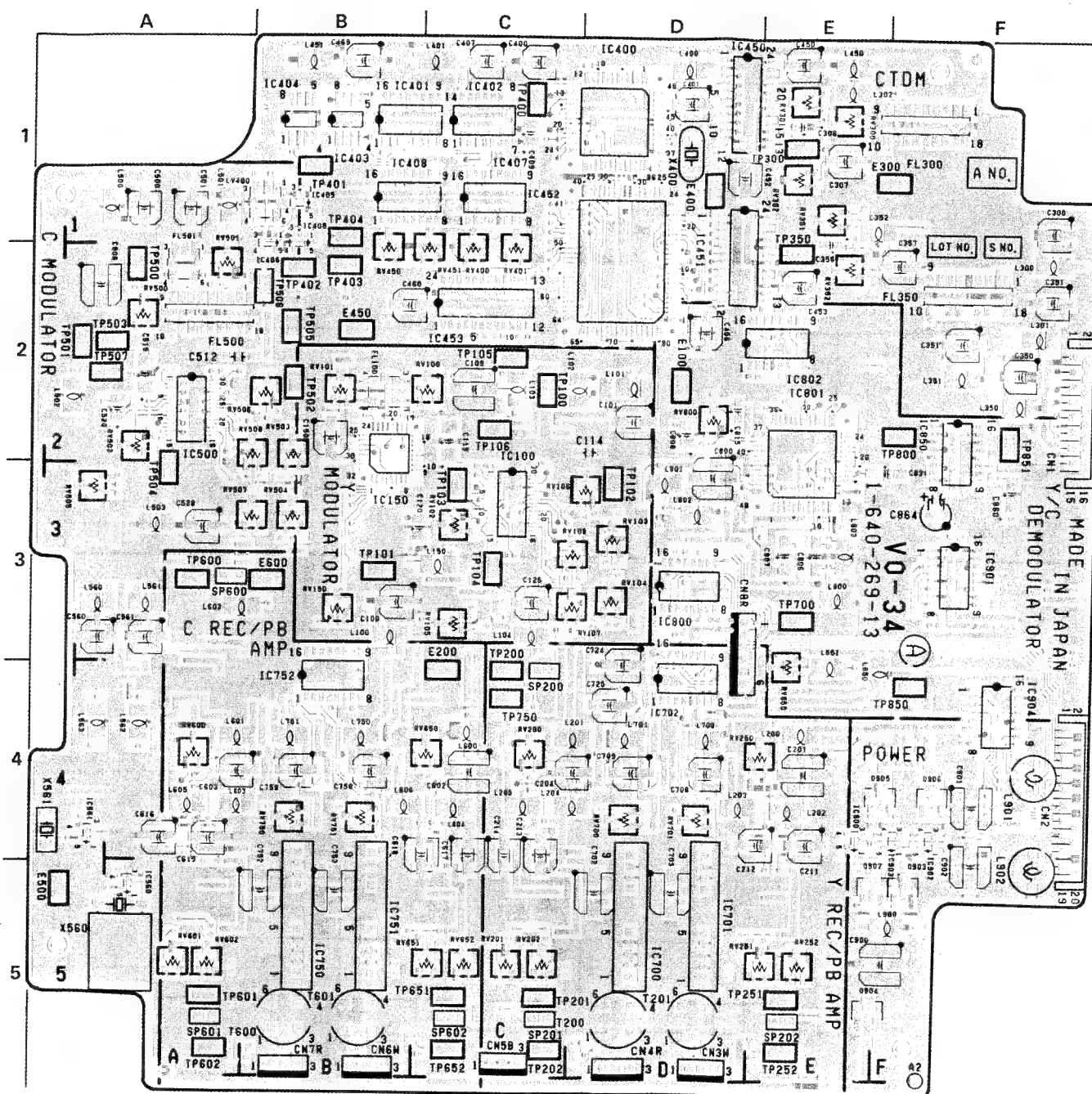
S/N 10101 through 11420

## VO-34P (1-640-269-13)

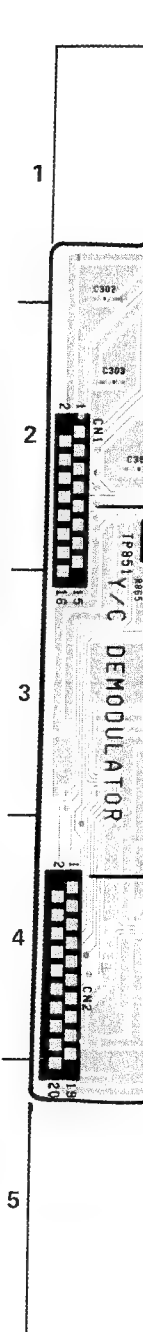
CN1	F-2	LV400	A-1	Q504	A-2 (B)	Q807	D-2 (B)	SP200	C-4
CN2	F-4			Q505	A-2 (B)	Q808	E-2 (B)	SP201	C-5
CN3	D-5	Q100	C-2 (B)	Q506	B-3 (B)	Q809	E-2 (B)	SP202	E-5
CN4	D-5	Q101	B-2 (B)	Q507	A-3 (B)	Q810	E-2 (B)	SP600	A-3
CN5	C-5	Q102	C-2 (B)	Q508	A-3 (B)	Q811	E-2 (B)	SP601	A-5
CN6	B-5	Q103	C-2 (B)	Q509	A-2 (B)	Q812	E-2 (B)	SP602	C-5
CN7	B-5	Q104	B-3 (B)	Q510	A-3 (B)	Q813	E-2 (B)		
CN8	D-3	Q105	B-3 (B)	Q511	A-3 (B)	Q850	E-3 (B)	SS200	C-4
		Q106	D-3 (B)	Q560	A-4 (B)	Q851	E-4 (B)	SS201	C-5
D400	B-1 (B)	Q107	C-3 (B)	Q561	A-4 (B)	Q852	E-4 (B)	SS202	E-5
D800	E-2 (B)	Q150	C-3 (B)	Q562	A-4 (B)	Q853	F-3 (B)	SS600	A-3
D801	E-2 (B)	Q151	B-3 (B)	Q563	A-4 (B)	Q900	F-4 (B)	SS601	A-5
D850	F-4 (B)	Q152	C-3 (B)	Q600	A-3 (B)	Q901	F-4 (B)	SS602	C-5
D851	F-3 (B)	Q153	B-3 (B)	Q601	B-4 (B)	Q902	E-5		
D900	F-5 (B)	Q154	C-3 (B)	Q602	A-3 (B)	Q903	F-5	TH400	C-1 (B)
D901	F-4 (B)	Q155	C-3 (B)	Q603	A-4 (B)	Q904	E-5		
D902	F-5 (B)	Q156	C-3 (B)	Q604	A-4 (B)	Q905	F-4		
		Q200	C-4 (B)	Q605	A-4 (B)	Q906	F-4		
		Q201	C-4 (B)	Q606	A-4 (B)				
E100	D-2	Q202	E-4 (B)	Q607	C-4 (B)	RV100	C-2		
E200	C-3	Q203	C-4 (B)	Q608	C-4 (B)	RV101	B-2		
E300	E-1	Q204	E-4 (B)	Q609	A-4 (B)	RV102	C-3		
E400	D-1	Q205	C-4 (B)	Q610	C-4 (B)	RV103	D-3		
E450	B-2	Q206	E-4 (B)	Q611	A-4 (B)	RV104	D-3		
E500	A-5	Q207	C-4 (B)	Q612	C-4 (B)	RV105	C-3		
E600	B-3	Q208	E-4 (B)	Q613	A-4 (B)	RV106	C-3		
		Q209	C-4 (B)	Q614	A-5 (B)	RV107	D-3		
FL100	B-2	Q210	C-5 (B)	Q615	C-4 (B)	RV108	C-3		
FL300	F-1	Q211	E-4 (B)	Q616	C-5 (B)	RV150	B-3		
FL350	F-2	Q212	E-5 (B)	Q617	A-5 (B)	RV200	C-4		
FL500	A-2	Q213	D-5 (B)	Q618	A-5 (B)	RV201	C-5		
FL501	A-1	Q214	C-5 (B)	Q619	C-5 (B)	RV202	C-5		
		Q215	E-5 (B)	Q620	B-5 (B)	RV250	D-4		
IC100	C-2	Q216	E-5 (B)	Q621	A-5 (B)	RV251	D-5		
IC150	B-3	Q217	E-5 (B)	Q622	A-5 (B)	RV252	E-5		
IC400	D-1	Q218	D-5 (B)	Q623	C-5 (B)	RV300	E-1		
IC401	B-1	Q219	C-5 (B)	Q624	B-5 (B)	RV301	E-1		
IC402	C-1	Q220	C-5 (B)	Q625	B-5 (B)	RV302	E-1		
IC403	B-1	Q221	D-5 (B)	Q626	C-5 (B)	RV351	E-1		
IC404	B-1	Q222	E-5 (B)	Q627	B-5 (B)	RV352	E-2		
IC405	B-1	Q223	D-5 (B)	Q628	B-5 (B)	RV400	C-2		
IC406	B-2	Q224	D-5 (B)	Q629	B-5 (B)	RV401	C-2		
IC407	C-1	Q225	D-5 (B)	Q630	B-5 (B)	RV450	B-2		
IC408	B-1	Q226	D-5 (B)	Q700	D-4 (B)	RV451	C-2		
IC409	B-1	Q300	F-1 (B)	Q701	D-4 (B)	RV500	A-2		
IC450	D-1	Q301	F-1 (B)	Q702	D-4 (B)	RV501	A-1		
IC451	D-1	Q302	E-1 (B)	Q703	D-4 (B)	RV502	A-2		
IC452	C-1	Q303	E-1 (B)	Q704	D-4 (B)	RV503	B-2		
IC453	C-2	Q304	E-1 (B)	Q705	D-4 (B)	RV504	B-3		
IC500	A-2	Q305	E-1 (B)	Q706	D-4 (B)	RV505	A-3		
IC560	A-5	Q306	E-1 (B)	Q707	D-4 (B)	RV506	A-2		
IC561	A-4	Q307	E-1 (B)	Q750	B-4 (B)	RV507	A-3		
IC700	D-5	Q350	F-2 (B)	Q751	B-4 (B)	RV508	B-2		
IC701	D-5	Q351	F-2 (B)	Q752	B-4 (B)	RV600	A-4		
IC702	D-4	Q352	F-2 (B)	Q753	B-4 (B)	RV601	A-5		
IC750	B-5	Q353	E-1 (B)	Q754	B-4 (B)	RV602	A-5		
IC751	B-5	Q354	E-1 (B)	Q755	B-4 (B)	RV650	C-4		
IC752	B-4	Q355	E-2 (B)	Q756	B-4 (B)	RV651	B-5		
IC800	D-3	Q356	E-2 (B)	Q757	B-4 (B)	RV652	C-5		
IC801	E-2	Q357	F-2 (B)	Q800	D-3 (B)	RV700	D-4		
IC802	E-2	Q400	C-1 (B)	Q801	D-3 (B)	RV701	D-4		
IC850	F-2	Q401	C-1 (B)	Q802	E-3 (B)	RV750	B-4		
IC900	E-4	Q500	A-2 (B)	Q803	E-3 (B)	RV751	B-4		
IC901	F-3	Q501	A-2 (B)	Q804	E-3 (B)	RV800	D-2		
IC902	F-4	Q502	A-1 (B)	Q805	E-2 (B)	RV850	E-4		
IC903	F-4	Q503	A-2 (B)	Q806	E-2 (B)				
IC904	F-4								

NOTE  
 \*-\* : \*-A SIDE  
 \*-v(B) : \*-B SIDE

A Side



B Side

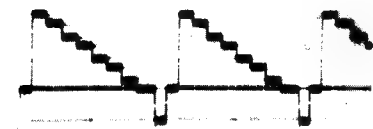


VO-34P -A SIDE-  
 1-640-269-13  
 PVV-1P



V0-34P (1/5)

① TP100 Y 1Vp-p REC mode  
H4 4.15 U



② IC100-2 pin 1Vp-p REC mode  
H4 4.15 U



③ IC150-17 pin 1Vp-p REC mode  
H4 4.15 U



④ TP101 Y 1Vp-p REC mode  
H4 4.15 U



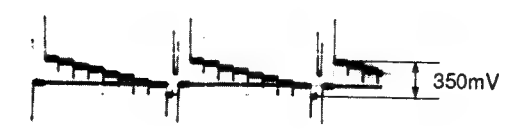
⑤ TP103 100mVp-p REC mode



⑥ IC100-5 pin 360mVp-p REC mode  
H4 4.15 U



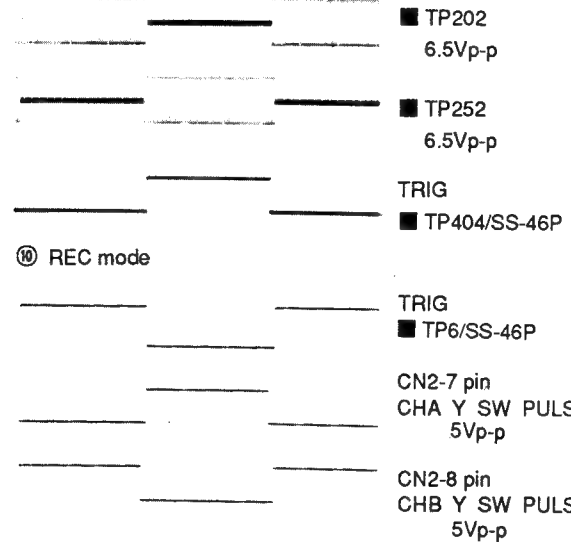
⑦ TP102 REC mode  
H4 4.15 U



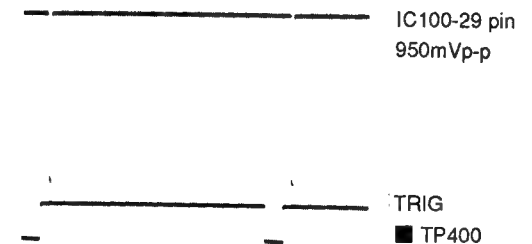
⑧ TP200 Y-FM 440mVp-p REC mode



⑨ REC mode

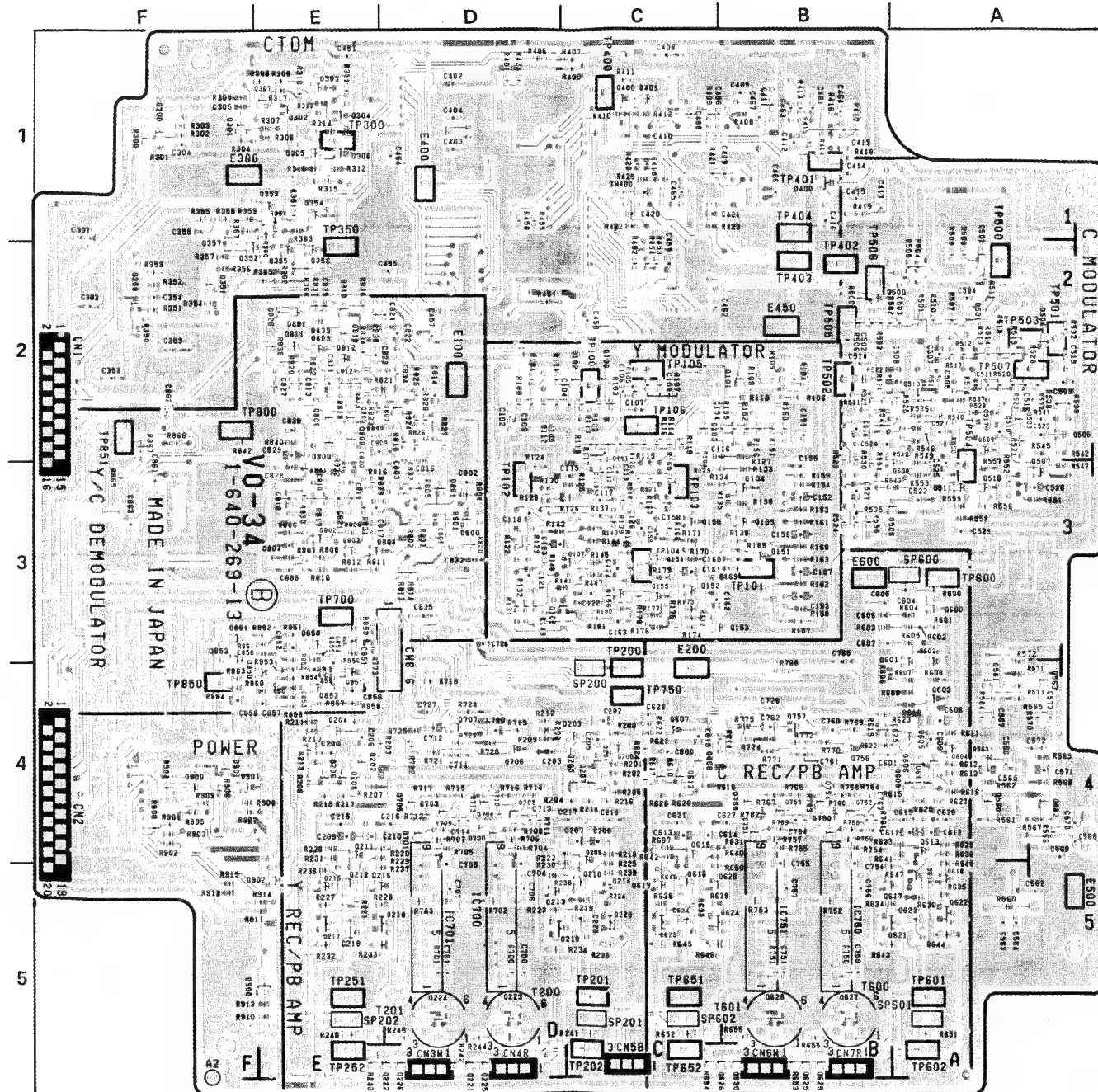


⑩ REC mode



REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

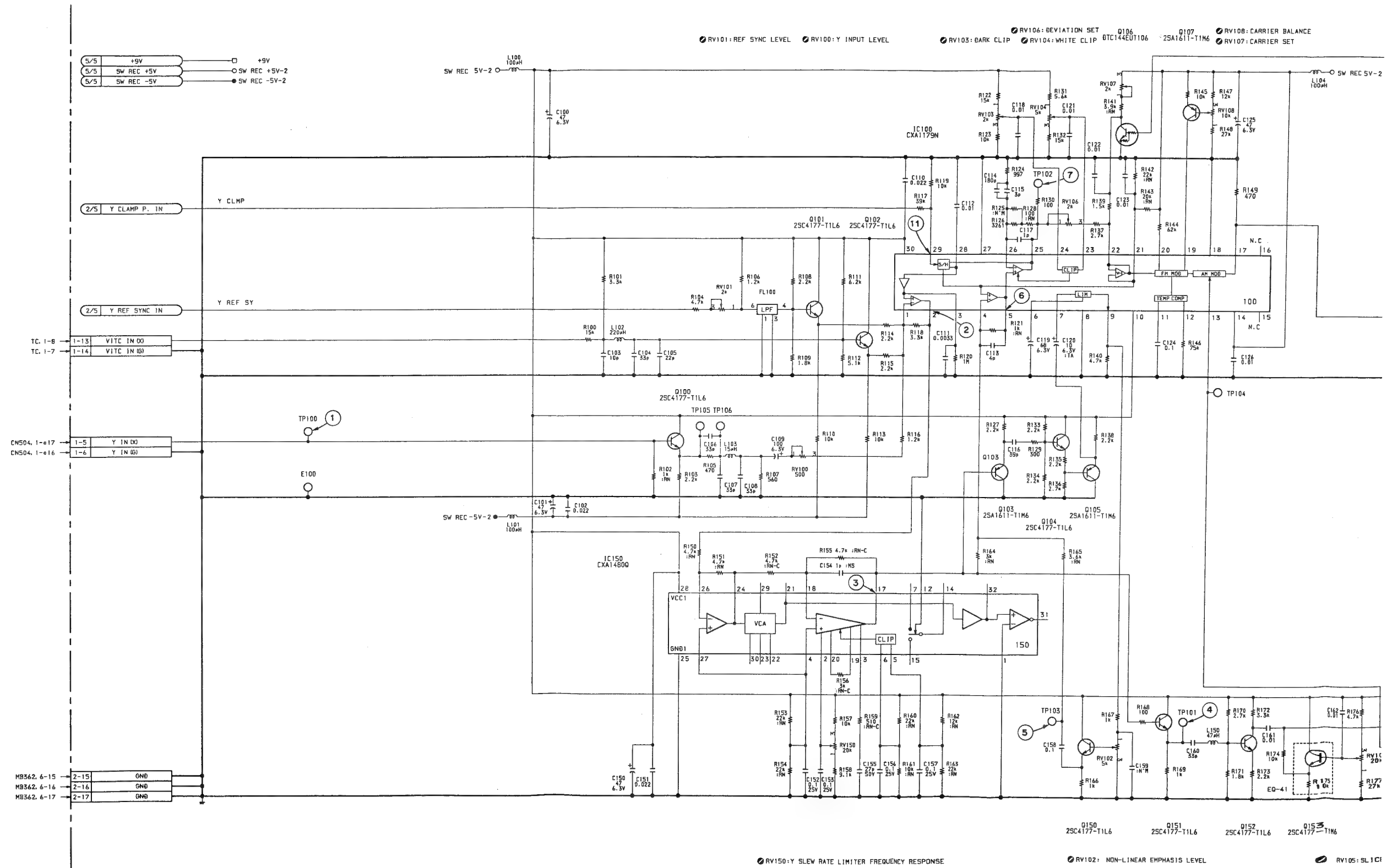
B Side



V0-34P -B SIDE-  
1-640-269-13  
PVV-1P

VO-34P BOARD (1/5)  
Y Modulator  
Y REC Amplifier

S/N 10101 through 11420



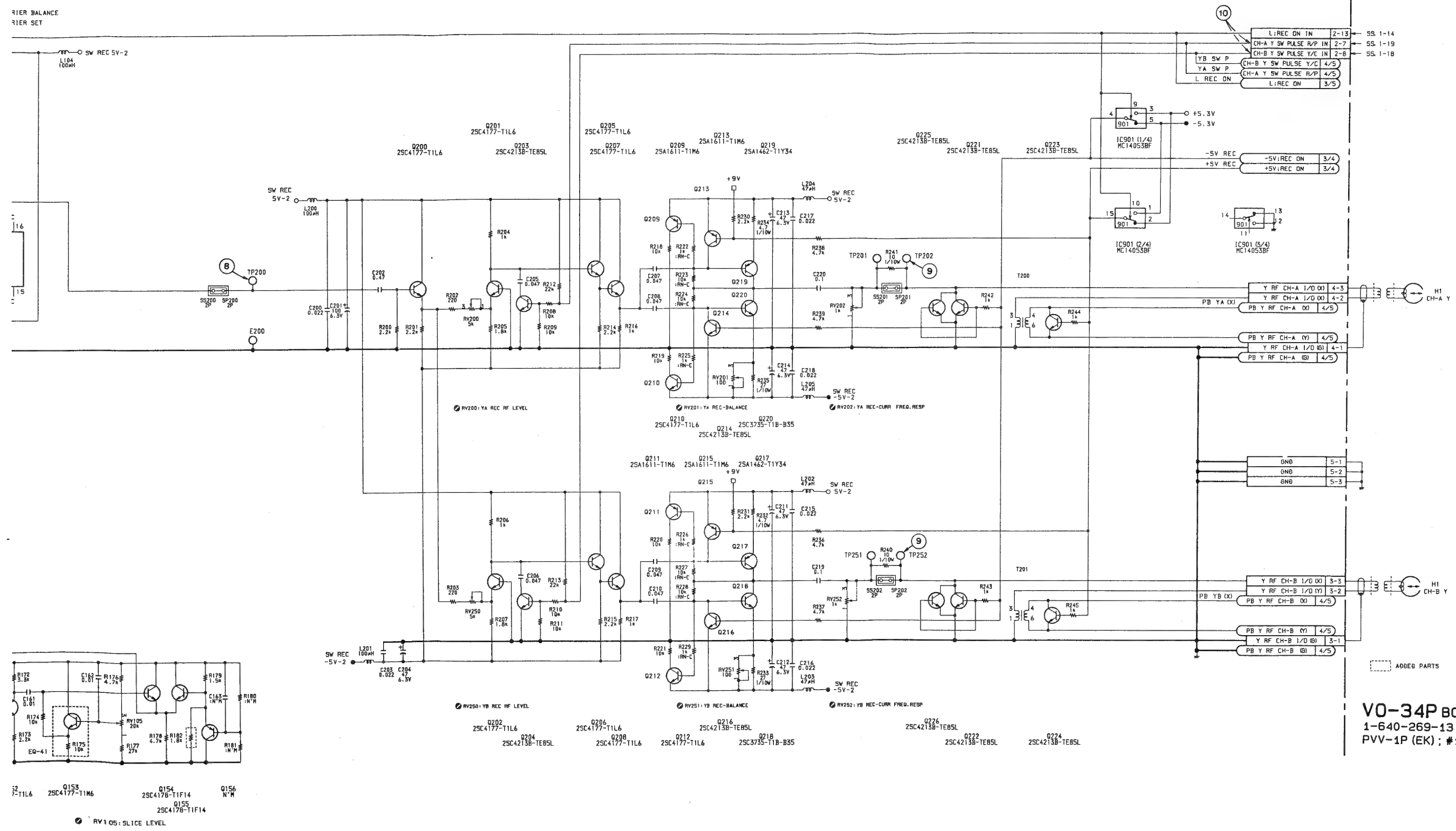
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V0-34P BOARD (1/5)  
1-640-269-13  
PVV-1P (EK); #10101-11420

11-3 (b)

11-3 (b)

11-3 (b)

H

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VO-34P BOARD

Video REC/PB

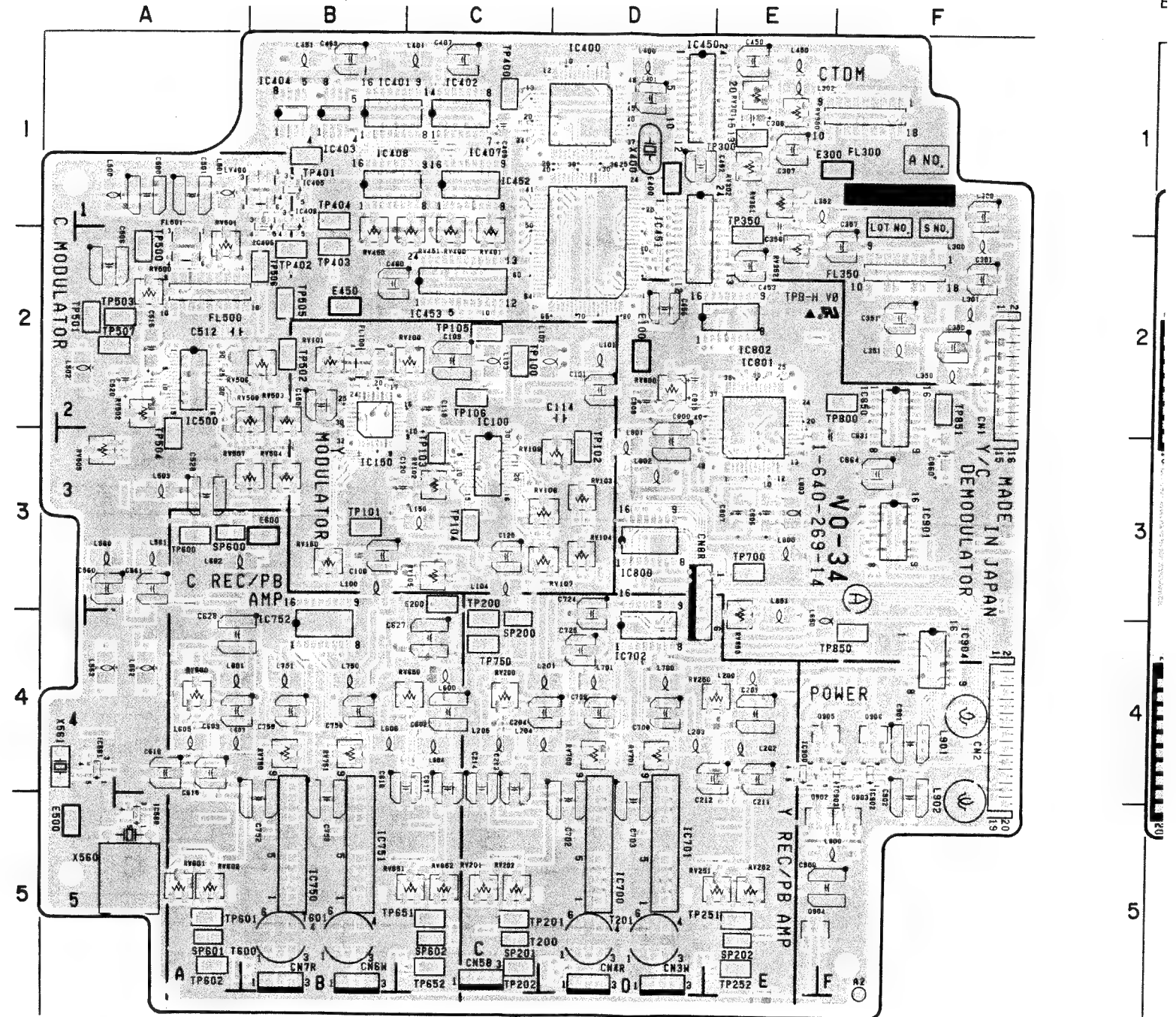
S/N 11421 through 12390

VO-34P (1-640-269-14)

CN1 F-2	LV400 A-1	Q507 A-3 (B)	Q810 E-2 (B)	SP600 A-3
CN2 F-4		Q508 A-3 (B)	Q811 E-2 (B)	SP601 A-5
CN3 D-5	Q100 C-2 (B)	Q509 A-2 (B)	Q812 E-2 (B)	SP602 C-5
CN4 D-5	Q101 C-2 (B)	Q510 A-3 (B)	Q813 E-2 (B)	
CN5 C-5	Q102 C-2 (B)	Q511 A-3 (B)	Q850 E-3 (B)	SS200 C-4
CN6 B-5	Q103 C-2 (B)	Q560 A-4 (B)	Q851 E-4 (B)	SS201 C-5
CN7 B-5	Q104 B-3 (B)	Q561 A-4 (B)	Q852 E-4 (B)	SS202 E-5
CN8 D-3	Q105 B-3 (B)	Q562 A-4 (B)	Q853 F-3 (B)	SS600 A-3
	Q106 C-3 (B)	Q563 A-4 (B)	Q900 F-4 (B)	SS601 A-5
D400 B-1 (B)	Q107 C-3 (B)	Q600 A-3 (B)	Q901 F-4 (B)	SS602 C-5
D800 E-2 (B)	Q150 C-3 (B)	Q601 A-4 (B)	Q902 E-5	
D801 E-2 (B)	Q151 B-3 (B)	Q602 A-3 (B)	Q903 F-4	TH400 C-1 (B)
D850 F-4 (B)	Q152 C-3 (B)	Q603 A-4 (B)	Q904 F-5	
D851 F-3 (B)	Q153 B-3 (B)	Q604 A-4 (B)	Q905 F-4	TP100 C-2
D900 F-5 (B)	Q154 C-3 (B)	Q605 A-4 (B)	Q906 F-4	TP101 B-3
D901 F-4 (B)	Q155 C-3 (B)	Q606 A-4 (B)		TP102 D-3
D902 F-5 (B)	Q200 C-4 (B)	Q607 C-4 (B)	RV100 C-2	TP103 C-3
E100 D-2	Q201 C-4 (B)	Q608 C-4 (B)	RV101 B-2	TP104 C-3
E200 C-3	Q202 E-4 (B)	Q609 A-4 (B)	RV102 C-3	TP105 C-2
E300 F-1	Q203 C-4 (B)	Q610 C-4 (B)	RV103 D-3	TP106 C-2
E400 D-1	Q204 E-4 (B)	Q611 A-4 (B)	RV104 D-3	TP200 C-3
E450 B-2	Q205 C-4 (B)	Q612 C-4 (B)	RV105 C-3	TP201 C-5
E500 A-5	Q206 E-4 (B)	Q613 A-4 (B)	RV106 C-3	TP202 C-5
E600 B-3	Q207 C-4 (B)	Q614 A-5 (B)	RV107 D-3	TP251 E-5
	Q208 E-4 (B)	Q615 C-4 (B)	RV108 D-3	TP252 E-5
	Q209 C-4 (B)	Q616 C-5 (B)	RV150 B-3	TP300 E-1
FL100 B-2	Q210 C-5 (B)	Q617 B-5 (B)	RV200 C-4	TP350 E-1
FL300 F-1	Q211 E-4 (B)	Q618 A-5 (B)	RV201 C-5	TP400 C-1
FL350 F-2	Q212 E-5 (B)	Q619 C-5 (B)	RV202 C-5	TP401 B-1
FL500 A-2	Q213 D-5 (B)	Q620 B-5 (B)	RV250 D-4	TP402 B-2
FL501 A-1	Q214 C-5 (B)	Q621 B-5 (B)	RV251 D-5	TP403 B-2
	Q215 E-5 (B)	Q622 A-5 (B)	RV252 E-5	TP404 B-1
IC100 C-2	Q216 D-5 (B)	Q623 C-5 (B)	RV300 E-1	TP500 A-2
IC150 B-3	Q217 E-5 (B)	Q624 B-5 (B)	RV301 E-1	TP501 A-2
IC400 D-1	Q218 D-5 (B)	Q625 B-5 (B)	RV302 E-1	TP502 B-2
IC401 B-1	Q219 D-5 (B)	Q626 C-5 (B)	RV351 E-1	TP503 A-2
IC402 C-1	Q220 C-5 (B)	Q627 B-5 (B)	RV352 E-2	TP504 A-3
IC403 B-1	Q221 D-5 (B)	Q628 B-5 (B)	RV400 C-2	TP505 B-2
IC404 B-1	Q222 E-5 (B)	Q629 B-5 (B)	RV401 C-2	TP506 B-2
IC405 B-1	Q223 D-5 (B)	Q630 B-5 (B)	RV450 B-2	TP507 A-2
IC406 B-2	Q224 D-5 (B)	Q700 D-4 (B)	RV451 C-2	TP600 A-3
IC407 C-1	Q225 D-5 (B)	Q701 D-4 (B)	RV500 A-2	TP601 A-5
IC408 B-1	Q226 D-5 (B)	Q702 D-4 (B)	RV501 A-1	TP602 A-5
IC409 B-1	Q300 F-1 (B)	Q703 D-4 (B)	RV502 A-2	TP651 C-5
IC450 D-1	Q301 F-1 (B)	Q704 D-4 (B)	RV503 B-2	TP652 C-5
IC451 D-2	Q302 E-1 (B)	Q705 D-4 (B)	RV504 B-3	TP700 E-3
IC452 C-1	Q303 E-1 (B)	Q706 D-4 (B)	RV505 A-3	TP750 C-4
IC453 C-2	Q304 E-1 (B)	Q707 D-4 (B)	RV506 A-2	TP800 F-2
IC500 A-2	Q305 E-1 (B)	Q750 B-4 (B)	RV507 A-3	TP850 F-4
IC560 A-5	Q306 E-1 (B)	Q751 B-4 (B)	RV508 B-2	TP851 F-2
IC561 A-4	Q350 F-2 (B)	Q752 B-4 (B)	RV600 A-4	
IC700 D-5	Q351 F-2 (B)	Q753 B-4 (B)	RV601 A-5	T200 D-5
IC701 D-5	Q352 F-2 (B)	Q754 B-4 (B)	RV602 A-5	T201 D-5
IC702 D-4	Q353 E-1 (B)	Q755 B-4 (B)	RV650 C-4	T600 B-5
IC750 B-5	Q354 E-1 (B)	Q756 B-4 (B)	RV651 B-5	T601 B-5
IC751 B-5	Q355 E-2 (B)	Q757 B-4 (B)	RV652 C-5	
IC752 B-4	Q356 E-2 (B)	Q800 D-3 (B)	RV700 D-4	X400 D-1
IC800 D-3	Q400 C-1 (B)	Q801 D-3 (B)	RV701 D-4	X560 A-5
IC801 E-2	Q401 C-1 (B)	Q802 E-3 (B)	RV750 B-4	X561 A-4
IC802 E-2	Q500 A-2 (B)	Q803 E-3 (B)	RV751 B-4	
IC850 F-2	Q501 A-2 (B)	Q804 D-3 (B)	RV800 D-2	
IC900 E-4	Q502 A-1 (B)	Q805 E-2 (B)	RV850 E-4	
IC901 F-3	Q503 A-2 (B)	Q806 E-2 (B)		SP200 C-4
IC902 F-4	Q504 A-2 (B)	Q807 D-2 (B)		SP201 C-5
IC903 F-4	Q505 A-2 (B)	Q808 E-2 (B)		SP202 E-5
IC904 F-4	Q506 A-3 (B)	Q809 E-2 (B)		

NOTE  
 \* : A SIDE  
 \* (B) : B SIDE

A Side

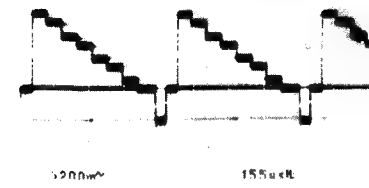


VO-34P -A SIDE-  
 1-640-269-14  
 PVV-1P

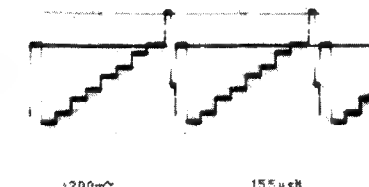


VO-34P (1/5)

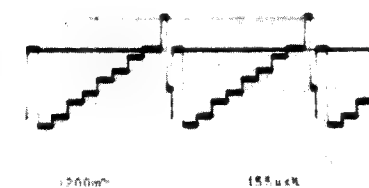
■ TP100 Y 1Vp-p REC mode  
H+ 4.15 V



IC100-2 pin 1Vp-p REC mode  
H+ 4.15 V



IC150-17 pin 1Vp-p REC mode  
H+ 4.15 V



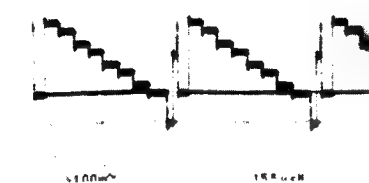
■ TP101 Y 1Vp-p REC mode  
H+ 4.15 V



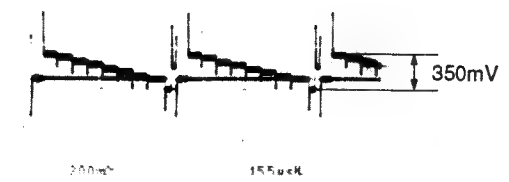
■ TP103 100mVp-p REC mode



IC100-5 pin 360mVp-p REC mode  
H+ 4.15 V



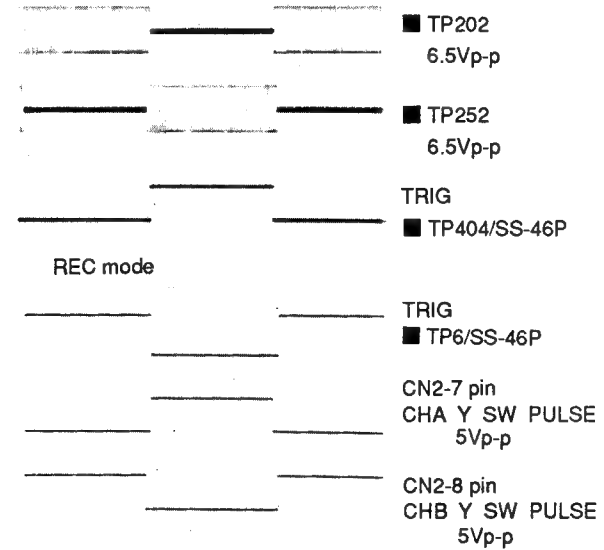
■ TP102 REC mode  
H+ 4.15 V



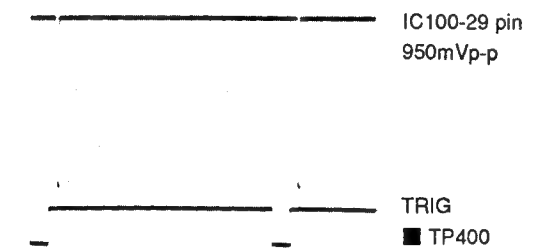
■ TP200 Y-FM 440mVp-p REC mode



REC mode

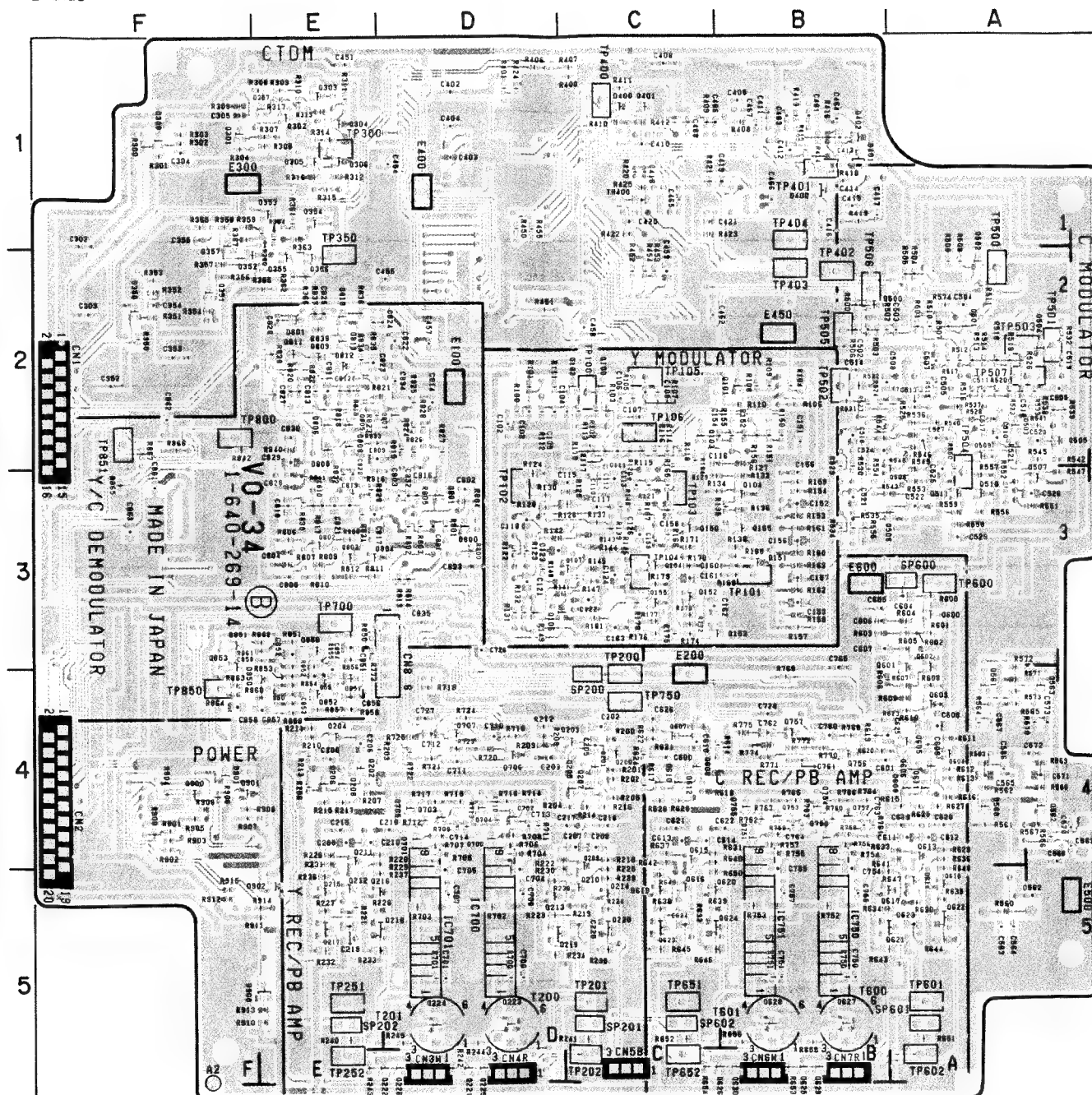


REC mode



REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

B Side

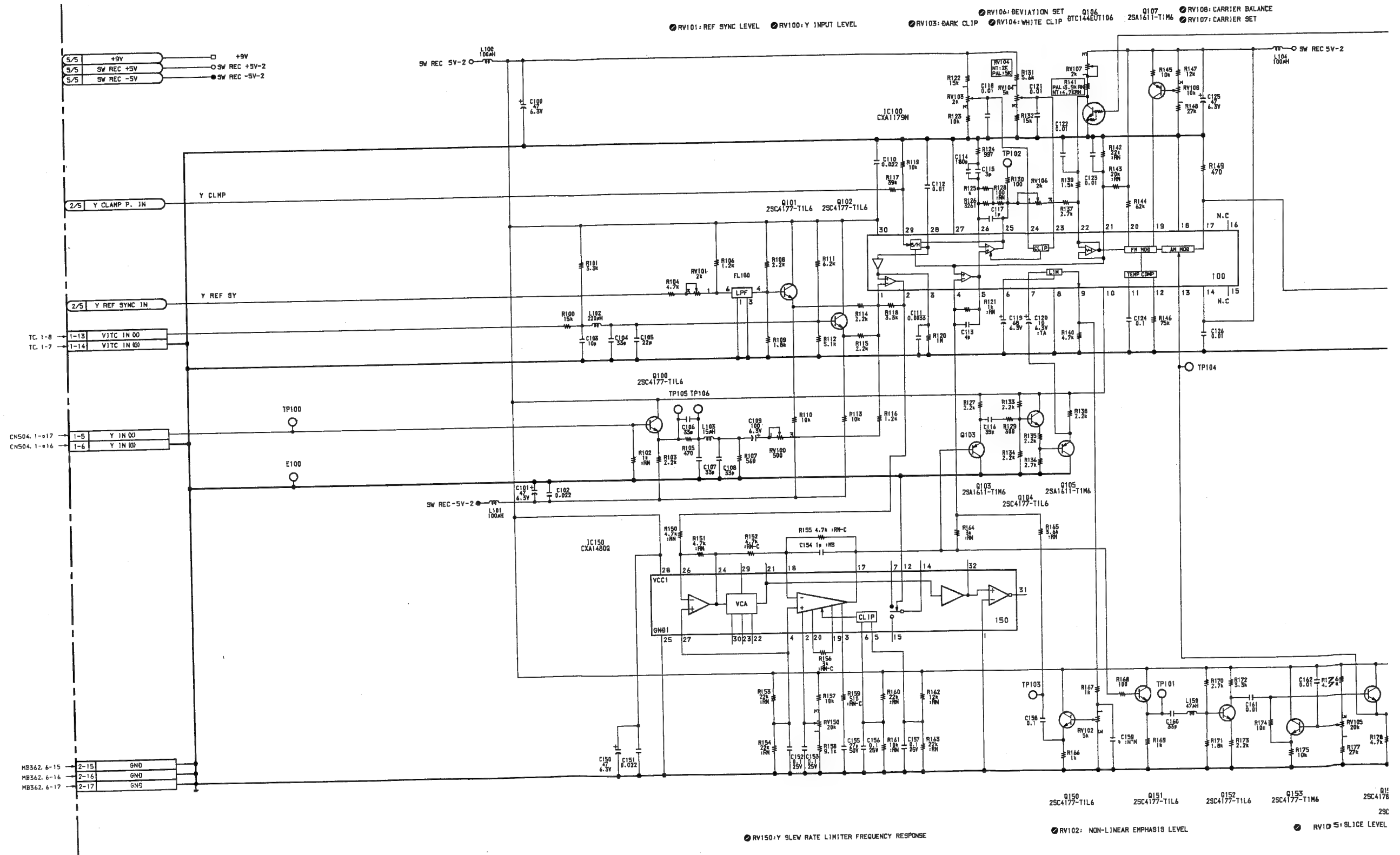


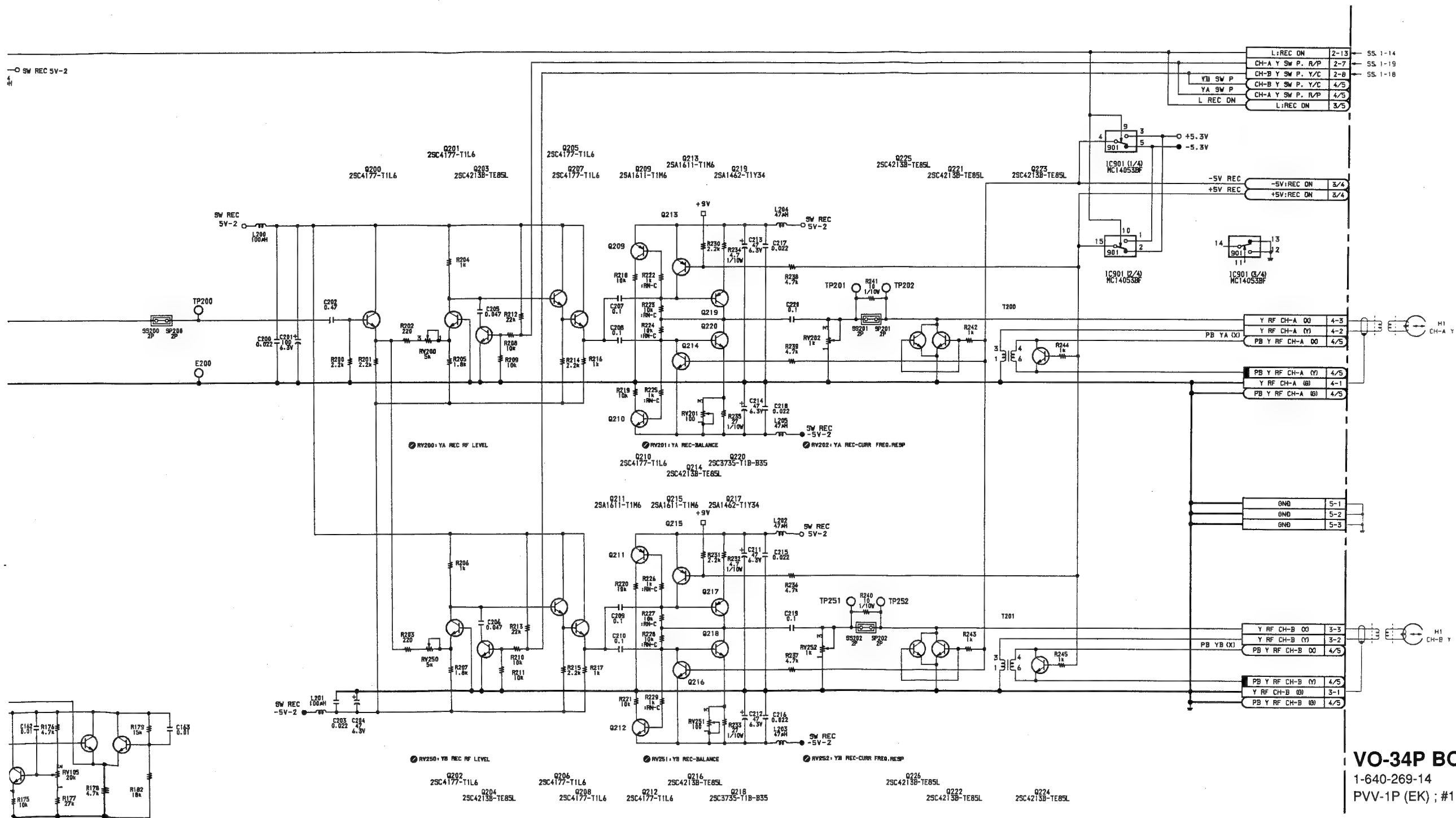
VO-34P .B SIDE-  
1-640-269-14  
PVV-1P

VO-34P BOARD (1/5)

Y Modulator  
Y REC Amplifier

S/N 11421 through 12390





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VO-34P BOARD  
Video REC/PB

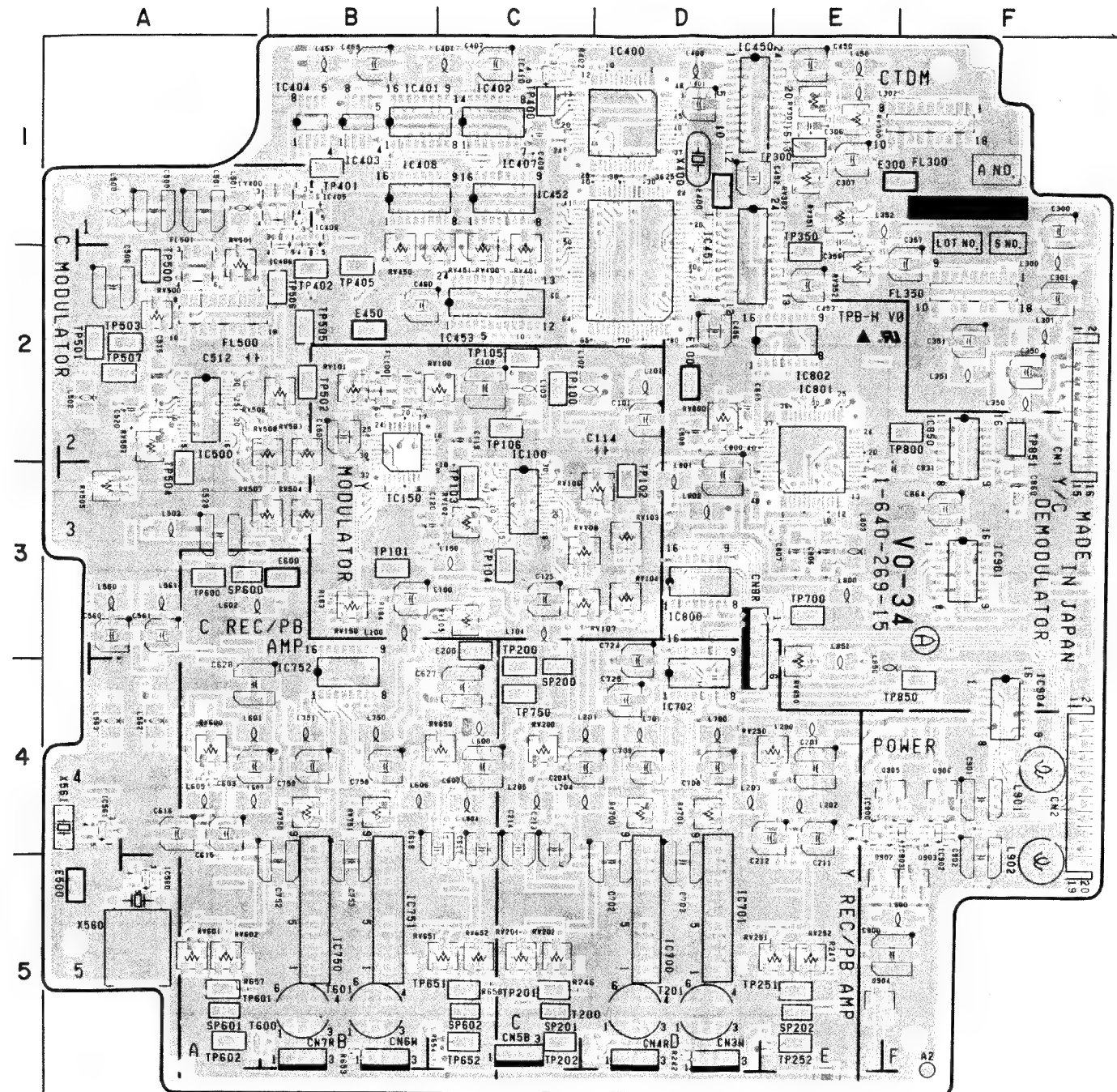
S/N 12391 and higher

VO-34P (1-640-269-15)

CN1 F-2	LV400 A-1	Q507 A-3 (B)	Q810 E-2 (B)	SP600 A-3
CN2 F-4		Q508 A-3 (B)	Q811 E-2 (B)	SP601 A-5
CN3 D-5	Q100 C-2 (B)	Q509 A-2 (B)	Q812 E-2 (B)	SP602 C-5
CN4 D-5	Q101 B-2 (B)	Q510 A-3 (B)	Q813 E-2 (B)	
CN5 C-5	Q102 C-2 (B)	Q511 A-3 (B)	Q850 E-3 (B)	SS200 C-2
CN6 B-5	Q103 C-2 (B)	Q560 A-4 (B)	Q851 E-4 (B)	SS201 C-5
CN7 B-5	Q104 B-3 (B)	Q561 A-4 (B)	Q852 E-4 (B)	SS202 E-5
CN8 D-3	Q105 B-3 (B)	Q562 A-4 (B)	Q853 F-3 (B)	SS600 A-3
	Q106 D-3 (B)	Q563 A-4 (B)	Q900 F-4 (B)	SS601 A-5
	Q107 C-3 (B)	Q600 A-3 (B)	Q901 F-4 (B)	SS602 C-5
D400 B-1 (B)	Q150 C-3 (B)	Q601 A-4 (B)	Q902 E-5	
D800 E-2 (B)	Q151 B-3 (B)	Q602 A-3 (B)	Q903 F-4	TH400 C-1 (B)
D801 E-2 (B)	Q152 C-3 (B)	Q603 A-4 (B)	Q904 F-5	
D850 F-4 (B)	Q153 B-3 (B)	Q604 A-4 (B)	Q905 F-4	TP100 C-2
D851 F-3 (B)	Q154 C-3 (B)	Q605 A-4 (B)	Q906 F-4	TP101 B-3
D900 F-5 (B)	Q155 C-3 (B)	Q606 A-4 (B)		TP102 D-3
D901 F-4 (B)	Q200 C-4 (B)	Q607 C-4 (B)		TP103 C-3
D902 F-5 (B)	Q201 C-4 (B)	Q608 C-4 (B)	RV100 C-2	TP104 C-3
	Q202 E-4 (B)	Q609 A-4 (B)	RV101 B-2	TP105 C-2
E100 D-2	Q203 C-4 (B)	Q610 C-4 (B)	RV102 C-3	TP106 C-2
E200 C-3	Q204 E-4 (B)	Q611 A-4 (B)	RV103 D-3	TP200 C-3
E300 F-1	Q205 C-4 (B)	Q612 C-4 (B)	RV104 D-3	TP201 C-5
E400 D-1	Q206 E-4 (B)	Q613 A-4 (B)	RV105 C-3	TP202 C-5
E450 B-2	Q207 C-4 (B)	Q614 A-5 (B)	RV106 C-3	TP251 E-5
E500 A-5	Q208 E-4 (B)	Q615 C-4 (B)	RV107 D-3	TP252 E-5
E600 B-3	Q209 C-4 (B)	Q616 C-5 (B)	RV108 D-3	TP300 E-1
	Q210 C-5 (B)	Q617 B-5 (B)	RV150 B-3	TP350 E-1
FL100 B-2	Q211 E-4 (B)	Q618 A-5 (B)	RV200 C-4	TP400 C-1
FL300 F-1	Q212 E-5 (B)	Q619 C-5 (B)	RV201 C-5	TP401 B-1
FL350 F-2	Q213 D-5 (B)	Q620 B-5 (B)	RV202 C-5	TP402 B-2
FL500 A-2	Q214 C-5 (B)	Q621 B-5 (B)	RV250 D-4	TP403 B-2
FL501 A-1	Q215 E-5 (B)	Q622 A-5 (B)	RV251 D-5	TP404 B-1
	Q216 D-5 (B)	Q623 C-5 (B)	RV252 E-5	TP500 A-2
IC100 C-2	Q217 E-5 (B)	Q624 B-5 (B)	RV300 E-1	TP501 A-2
IC150 B-3	Q218 D-5 (B)	Q625 B-5 (B)	RV301 E-1	TP502 B-2
IC400 D-1	Q219 D-5 (B)	Q626 C-5 (B)	RV302 E-1	TP503 A-2
IC401 B-1	Q220 C-5 (B)	Q627 B-5 (B)	RV351 E-1	TP504 A-3
IC402 C-1	Q221 D-5 (B)	Q628 B-5 (B)	RV352 E-2	TP505 B-2
IC403 B-1	Q222 E-5 (B)	Q629 B-5 (B)	RV400 C-2	TP506 B-2
IC404 B-1	Q223 D-5 (B)	Q630 B-5 (B)	RV401 C-2	TP507 A-2
IC405 B-1	Q224 D-5 (B)	Q630 B-5 (B)	RV450 B-2	TP600 A-3
IC406 B-2	Q225 D-5 (B)	Q700 D-4 (B)	RV451 C-2	TP601 A-5
IC407 C-1	Q226 D-5 (B)	Q701 D-4 (B)	RV500 A-2	TP602 A-5
IC408 B-1	Q300 F-1 (B)	Q702 D-4 (B)	RV501 A-1	TP651 C-5
IC409 B-1	Q301 F-1 (B)	Q703 D-4 (B)	RV502 A-2	TP652 C-5
IC450 D-1	Q302 E-1 (B)	Q704 D-4 (B)	RV503 B-2	TP700 E-3
IC451 D-2	Q303 E-1 (B)	Q705 D-4 (B)	RV504 B-3	TP750 C-4
IC452 C-1	Q304 E-1 (B)	Q706 D-4 (B)	RV505 A-3	TP800 F-2
IC453 C-2	Q305 E-1 (B)	Q707 D-4 (B)	RV506 A-2	TP850 F-4
IC500 A-2	Q306 E-1 (B)	Q750 B-4 (B)	RV507 A-3	TP851 F-2
IC560 A-5	Q350 F-2 (B)	Q751 B-4 (B)	RV508 B-2	
IC561 A-4	Q351 F-2 (B)	Q752 B-4 (B)	RV600 A-4	
IC700 D-5	Q352 F-2 (B)	Q753 B-4 (B)	RV601 A-5	
IC701 D-5	Q353 E-1 (B)	Q754 B-4 (B)	RV602 A-5	
IC702 D-4	Q354 E-1 (B)	Q755 B-4 (B)	RV650 C-4	
IC750 B-5	Q355 E-2 (B)	Q756 B-4 (B)	RV651 B-5	
IC751 B-5	Q356 E-2 (B)	Q757 B-4 (B)	RV652 C-5	
IC752 B-4	Q400 C-1 (B)	Q800 D-3 (B)	RV700 D-4	
IC800 D-3	Q401 C-1 (B)	Q801 D-3 (B)	RV701 D-4	
IC801 E-2	Q500 A-2 (B)	Q802 E-3 (B)	RV750 B-4	
IC802 E-2	Q501 A-2 (B)	Q803 E-3 (B)	RV751 B-4	
IC850 F-2	Q502 A-1 (B)	Q804 D-3 (B)	RV800 D-2	
IC900 E-4	Q503 A-2 (B)	Q805 E-2 (B)	RV850 E-4	
IC901 F-3	Q504 A-2 (B)	Q806 E-2 (B)		
IC902 F-4	Q505 A-2 (B)	Q807 D-2 (B)	SP200 C-4	
IC903 F-4	Q506 A-3 (B)	Q808 E-2 (B)	SP201 C-5	
IC904 F-4		Q809 E-2 (B)	SP202 E-5	

NOTE  
\* A SIDE  
\* (B); \* B SIDE

A Side



B Side

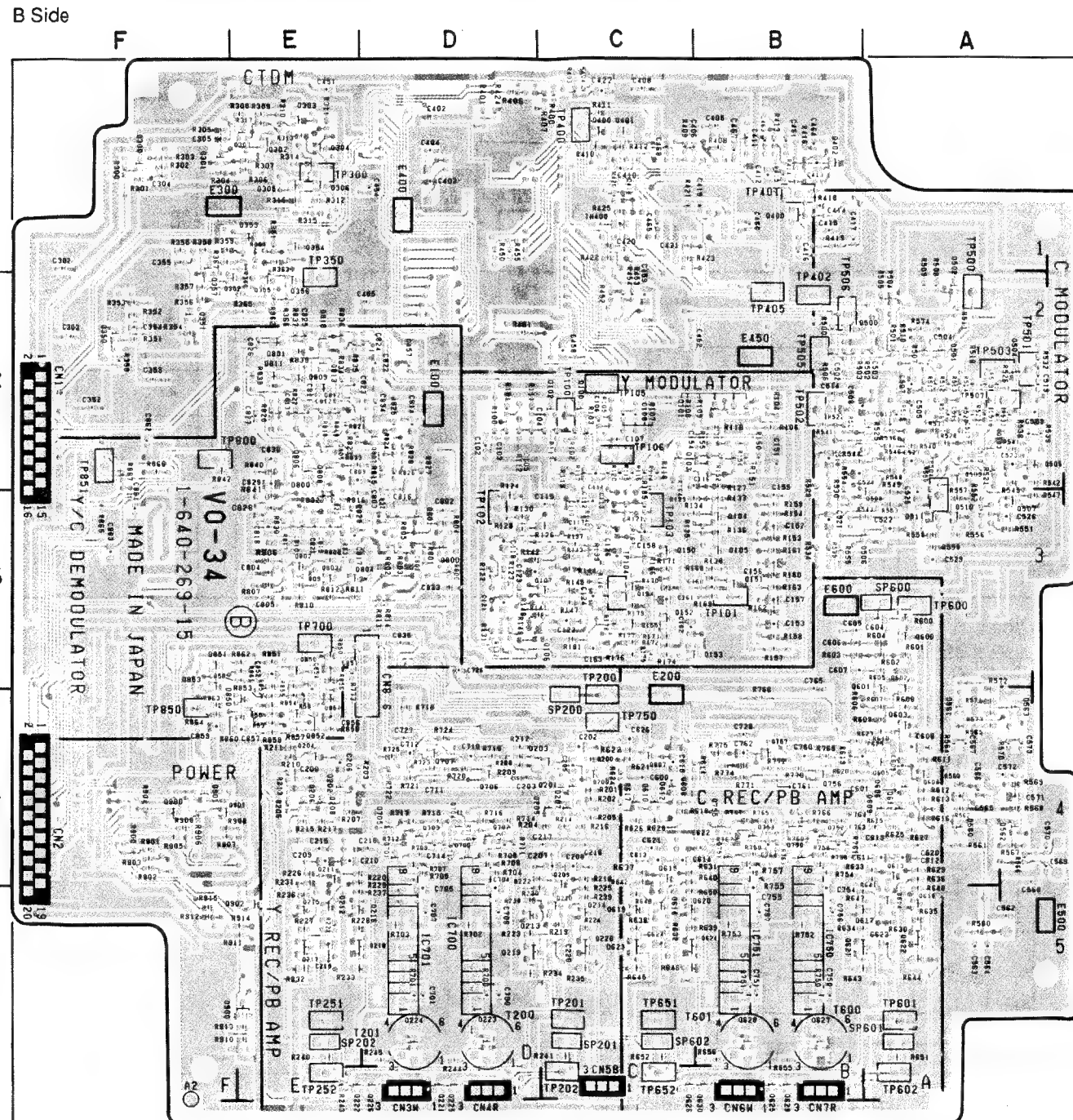
VO-34P -A SIDE-  
1-640-269-15  
PVV-1P



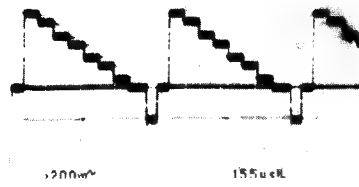
VO-34P (1/5)

■ TP100 Y 1Vp-p REC mode  
H+ 4.15 U

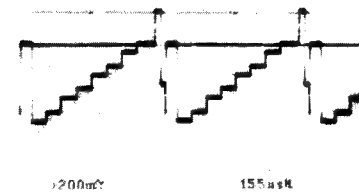
■ TP102 REC mode  
H+ 4.15 U



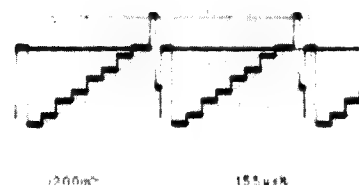
**VO-34P -B SIDE-**  
1-640-269-15  
PVV-1P



IC100-2 pin 1Vp-p REC mode  
H+ 4.15 U



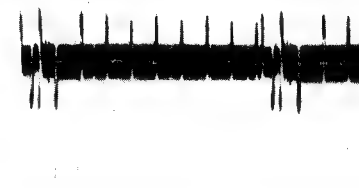
IC150-17 pin 1Vp-p REC mode  
H+ 4.15 U



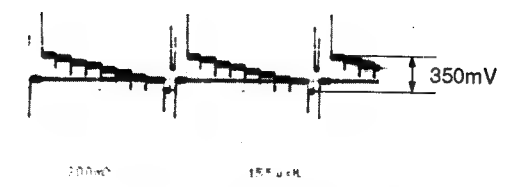
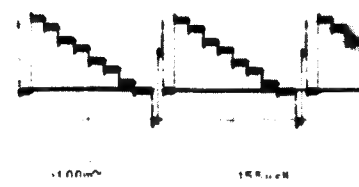
■ TP101 Y 1Vp-p REC mode  
H+ 4.15 U



■ TP103 100mVp-p REC mode



IC100-5 pin 360mVp-p REC mode  
H+ 4.15 U



■ TP200 Y-FM 440mVp-p REC mode



REC mode

■ TP202 6.5Vp-p

■ TP252 6.5Vp-p

TRIG  
■ TP404/SS-46P

REC mode

TRIG  
■ TP6/SS-46P

CN2-7 pin  
CHA Y SW PULSE  
5Vp-p

CN2-8 pin  
CHB Y SW PULSE  
5Vp-p

REC mode

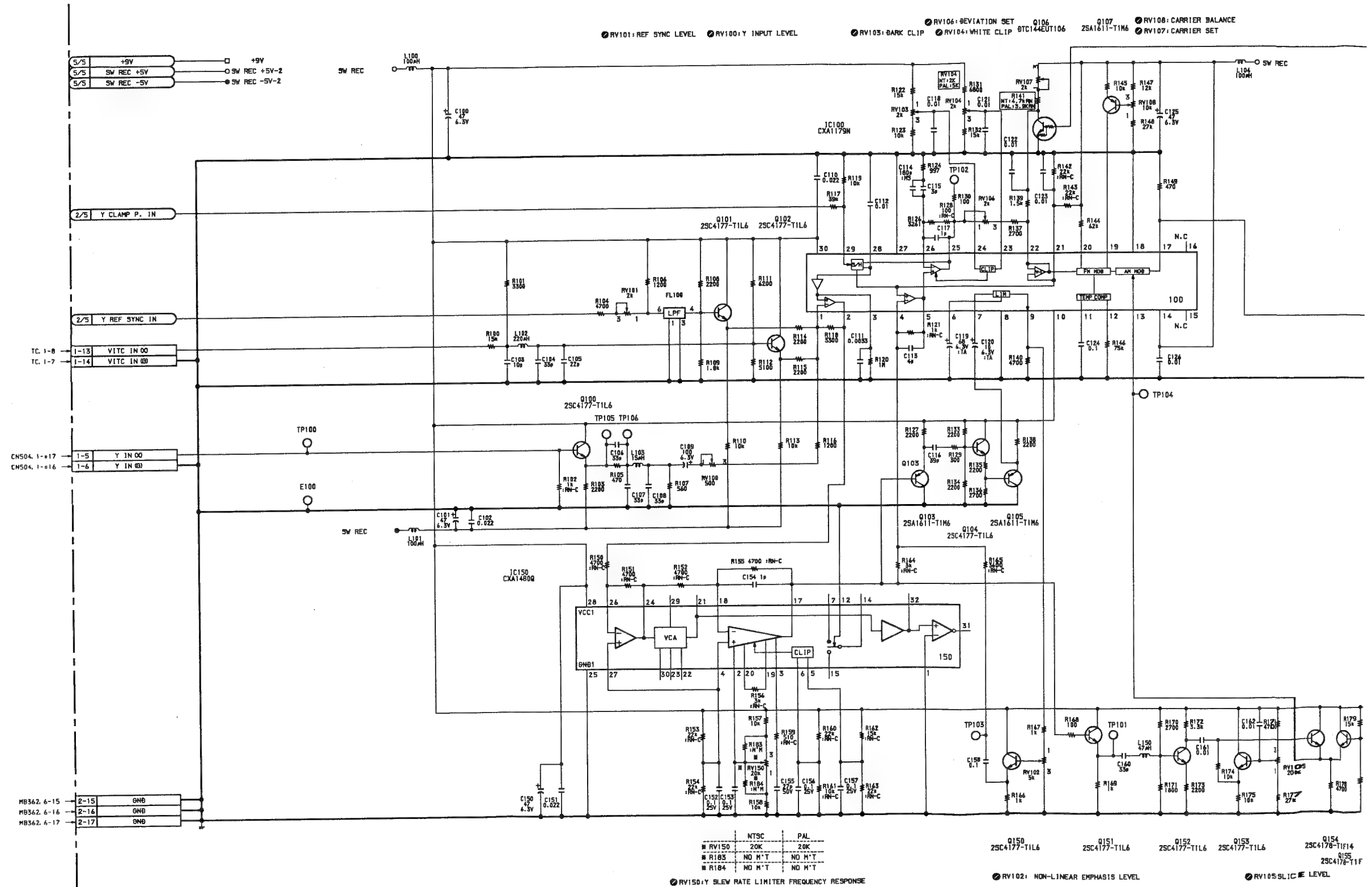
IC100-29 pin  
950mVp-p

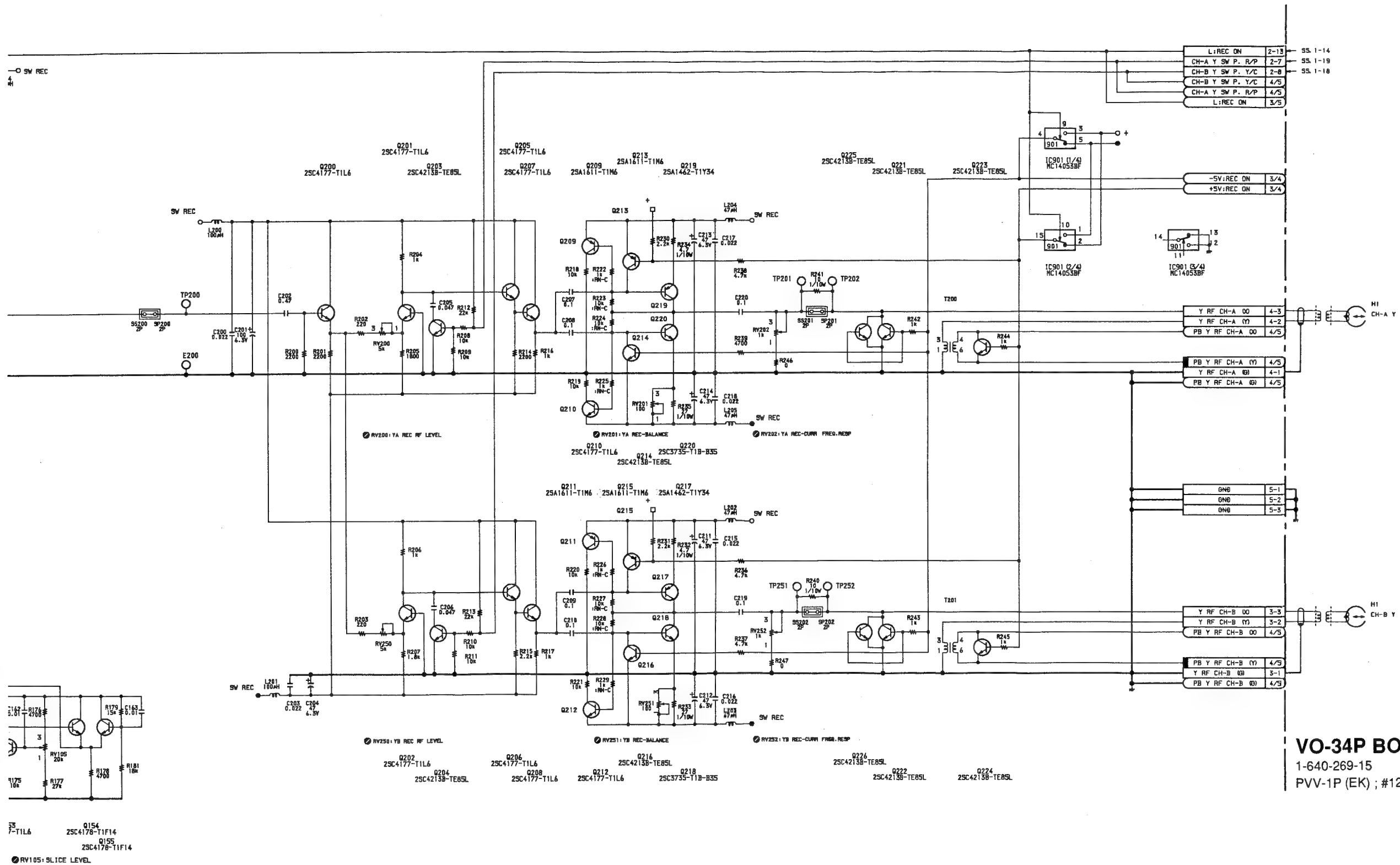
TRIG  
■ TP400

REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

**VO-34P BOARD (1/5)**  
Y Modulator  
Y REC Amplifier

S/N 12391 and higher





**VO-34P BOARD (1/5)**  
1-640-269-15  
PVV-1P (EK) ; #12391-

1

2

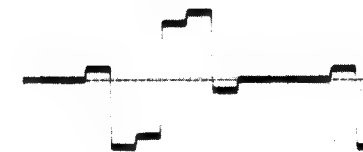
3

4

5

V0-34P (2/5) S/N 10001 through 10100

① CN1-1 pin R-Y 700mVp-p REC mode



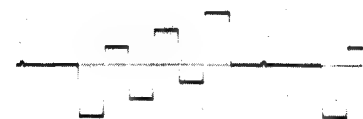
② CN1-3 pin B-Y 700mVp-p REC mode



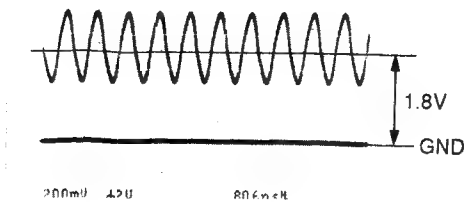
③ TP300 R-Y 1.45Vp-p REC mode



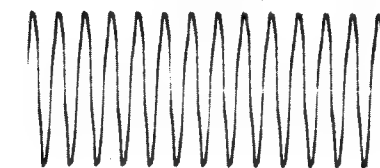
④ TP350 B-Y 1.45Vp-p REC mode



⑤ TP401 PLL VCO REC mode  
R1 1.75 V



⑥ TP402 R-CK 6Vp-p REC mode



⑦ TP403 Y REF SYNC 5Vp-p REC mode



⑧ TP404 C REF SYNC 5Vp-p REC mode



REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.



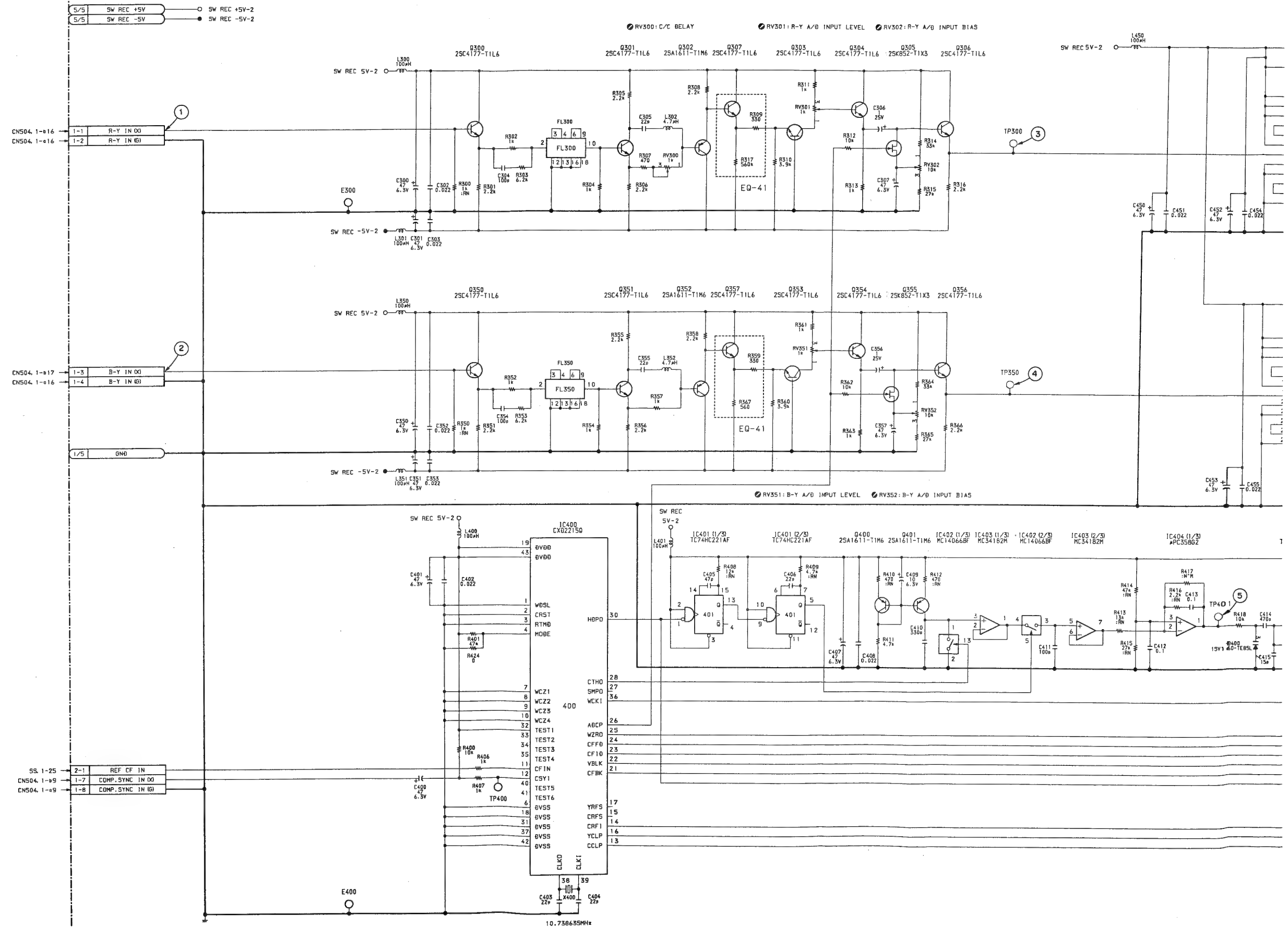
# V0-34P BOARD (2/5)

R-Y/B-Y Compressor  
Timing Generator

S/N 10001 through 10100

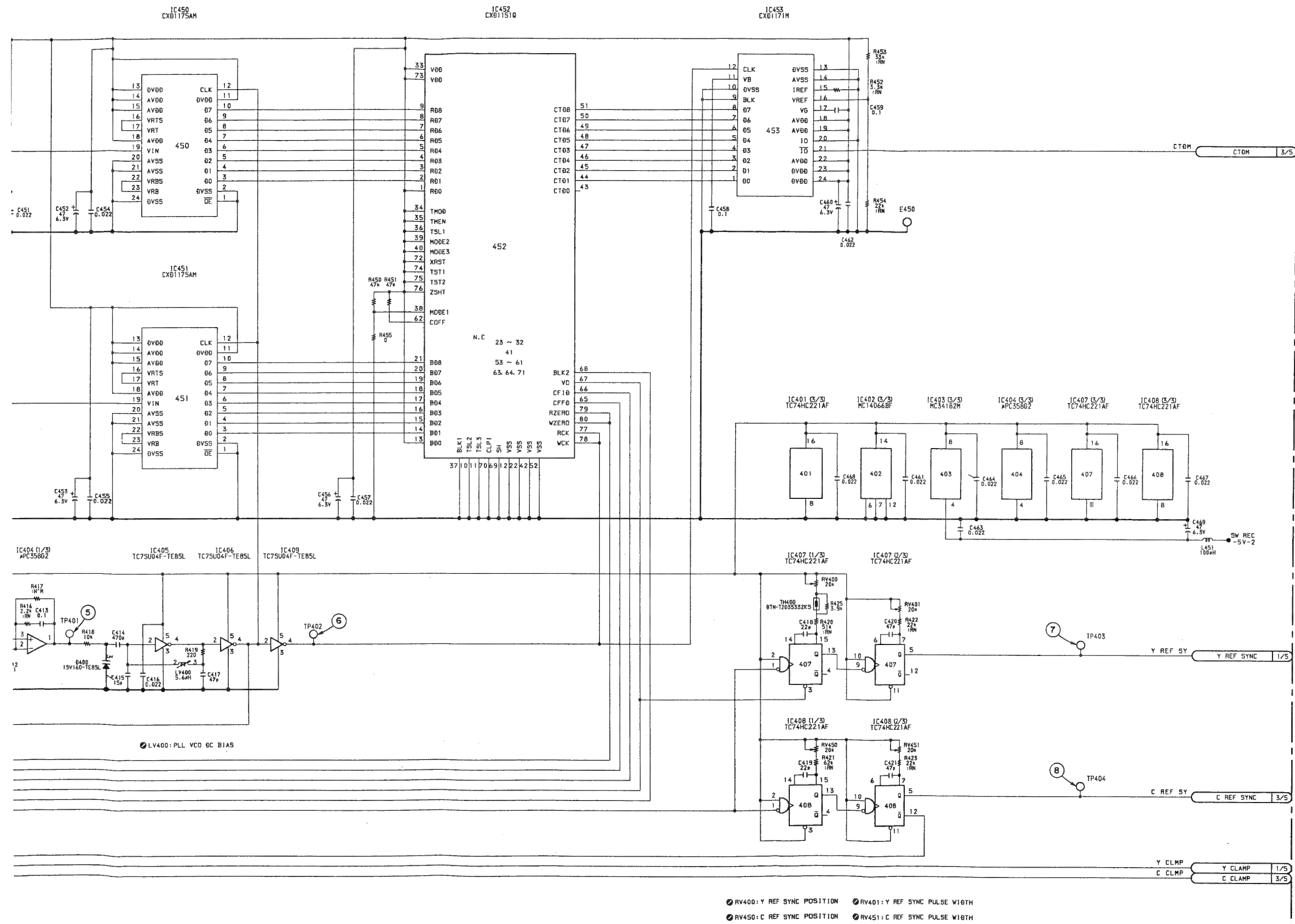
V0-34P (2/5)

V0-34P (2/5)



11-5 (a)

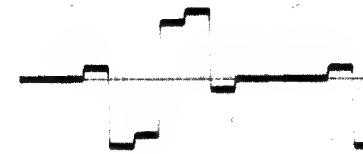
11-5 (a)



V0-34P BOARD (2/5)  
1-640-269-12  
PVV-1P (EK) ; #10001-10100

1  
2  
3  
4  
5

① CN1-1 pin R-Y 700mVp-p REC mode



② CN1-3 pin B-Y 700mVp-p REC mode



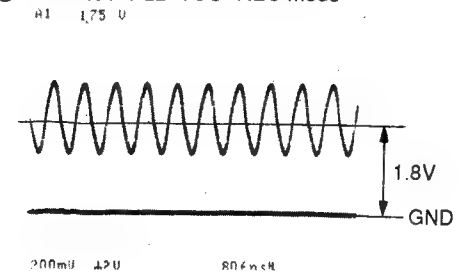
③ TP300 R-Y 1.45Vp-p REC mode



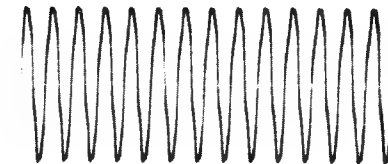
④ TP350 B-Y 1.45Vp-p REC mode



⑤ TP401 PLL VCO REC mode



⑥ TP402 R-CK 6Vp-p REC mode



⑦ TP403 Y REF SYNC 5Vp-p REC mode



⑧ TP404 C REF SYNC 5Vp-p REC mode



REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

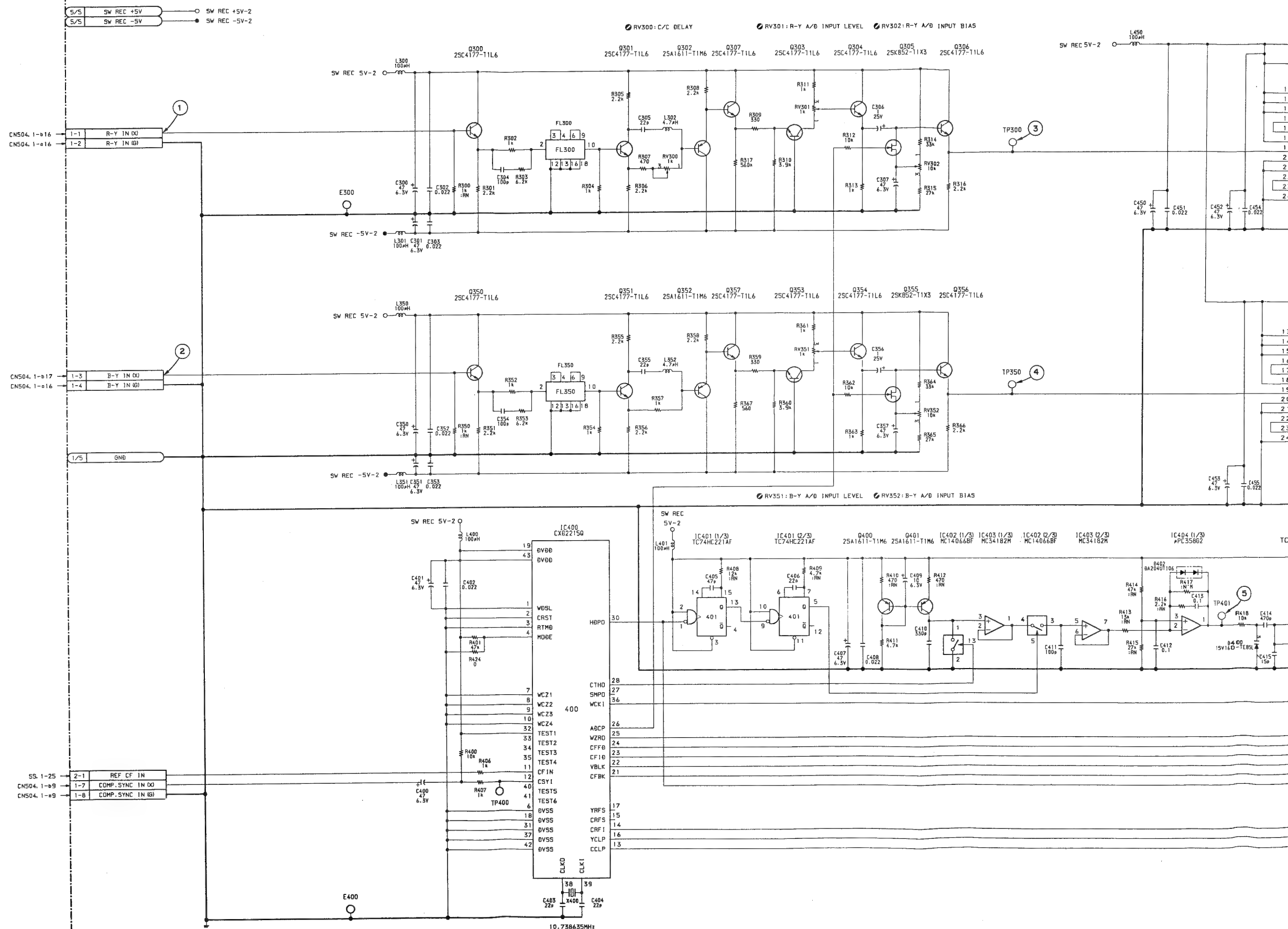
# V0-34P BOARD (2/5)

R-Y/B-Y Compressor  
Timing Generator

S/N 10101 through 11420

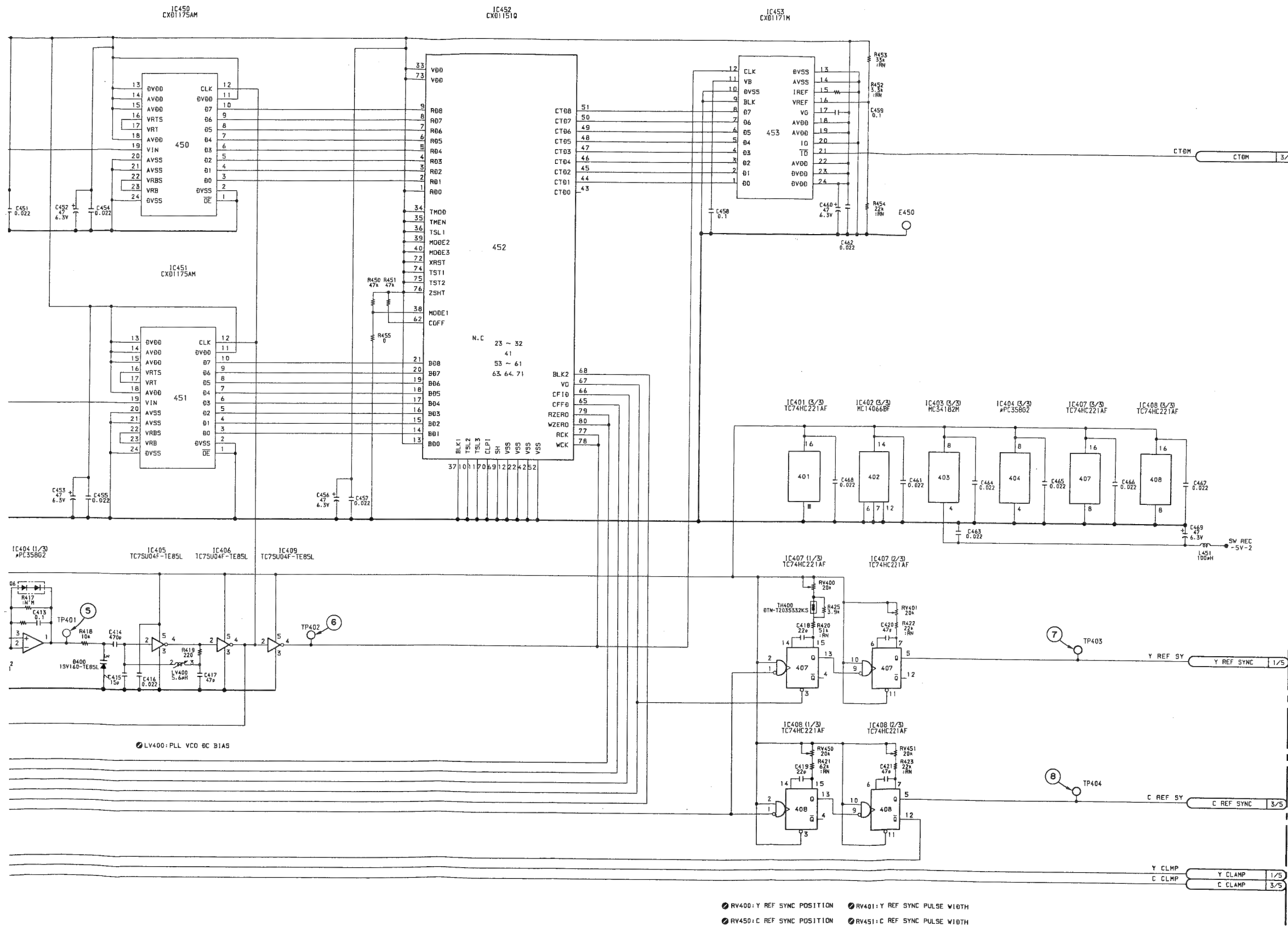
V0-34P (2/5)

V0-34P (2/5)



11-5 (b)

11-5 (b)

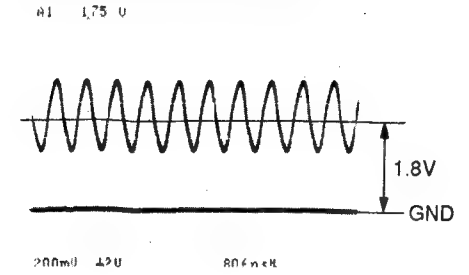


V0-34P BOARD (2/5)  
1-640-269-13  
PVV-1P (EK); #10101-11420

CN1-1 pin R-Y 700mVp-p REC mode



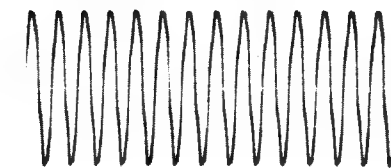
TP401 PLL VCO REC mode



CN1-3 pin B-Y 700mVp-p REC mode



TP402 R-CK 6Vp-p REC mode



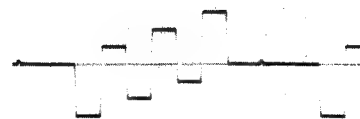
TP300 R-Y 1.45Vp-p REC mode



TP403 Y REF SYNC 5Vp-p REC mode



TP350 B-Y 1.45Vp-p REC mode



TP404 C REF SYNC 5Vp-p REC mode

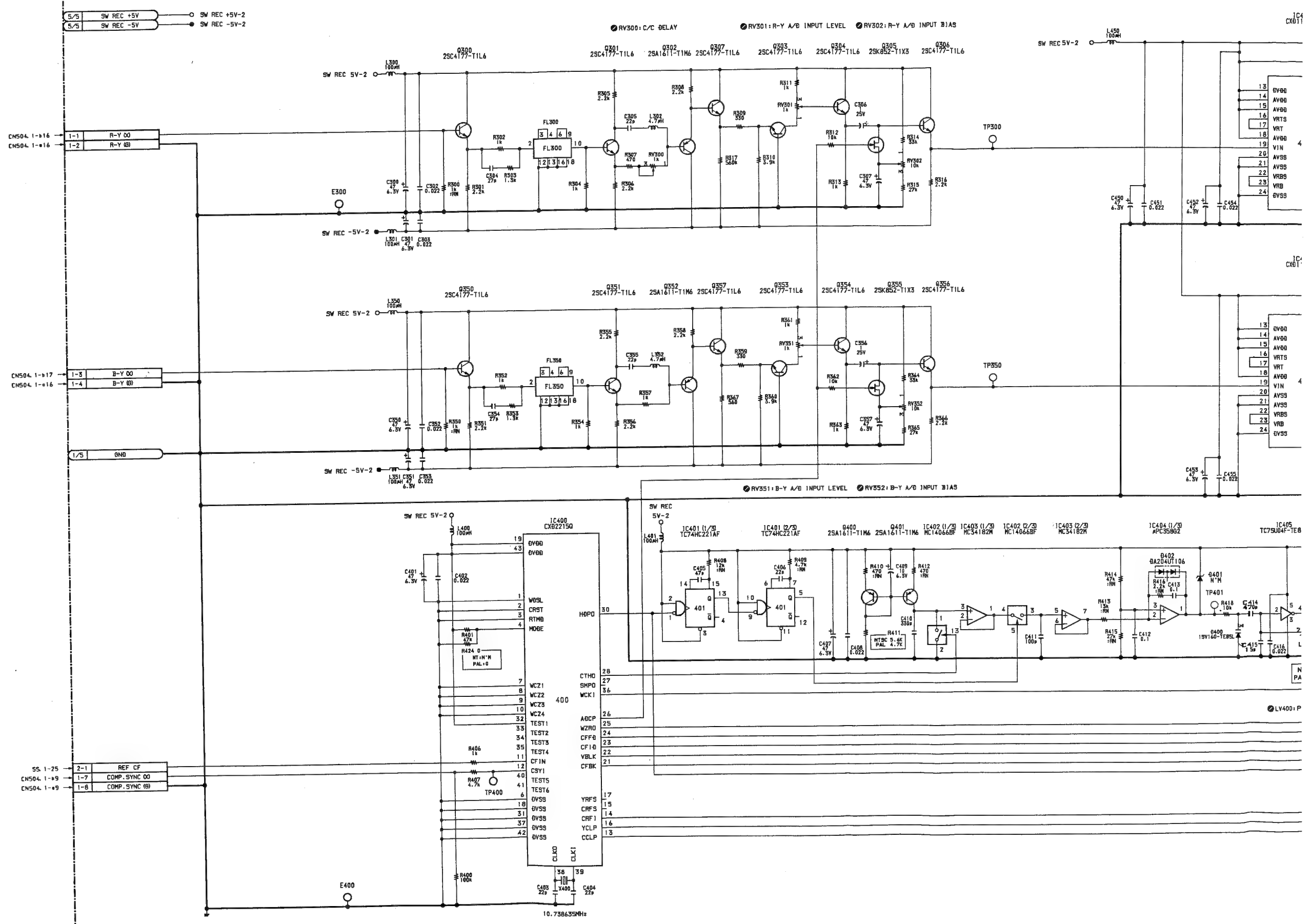


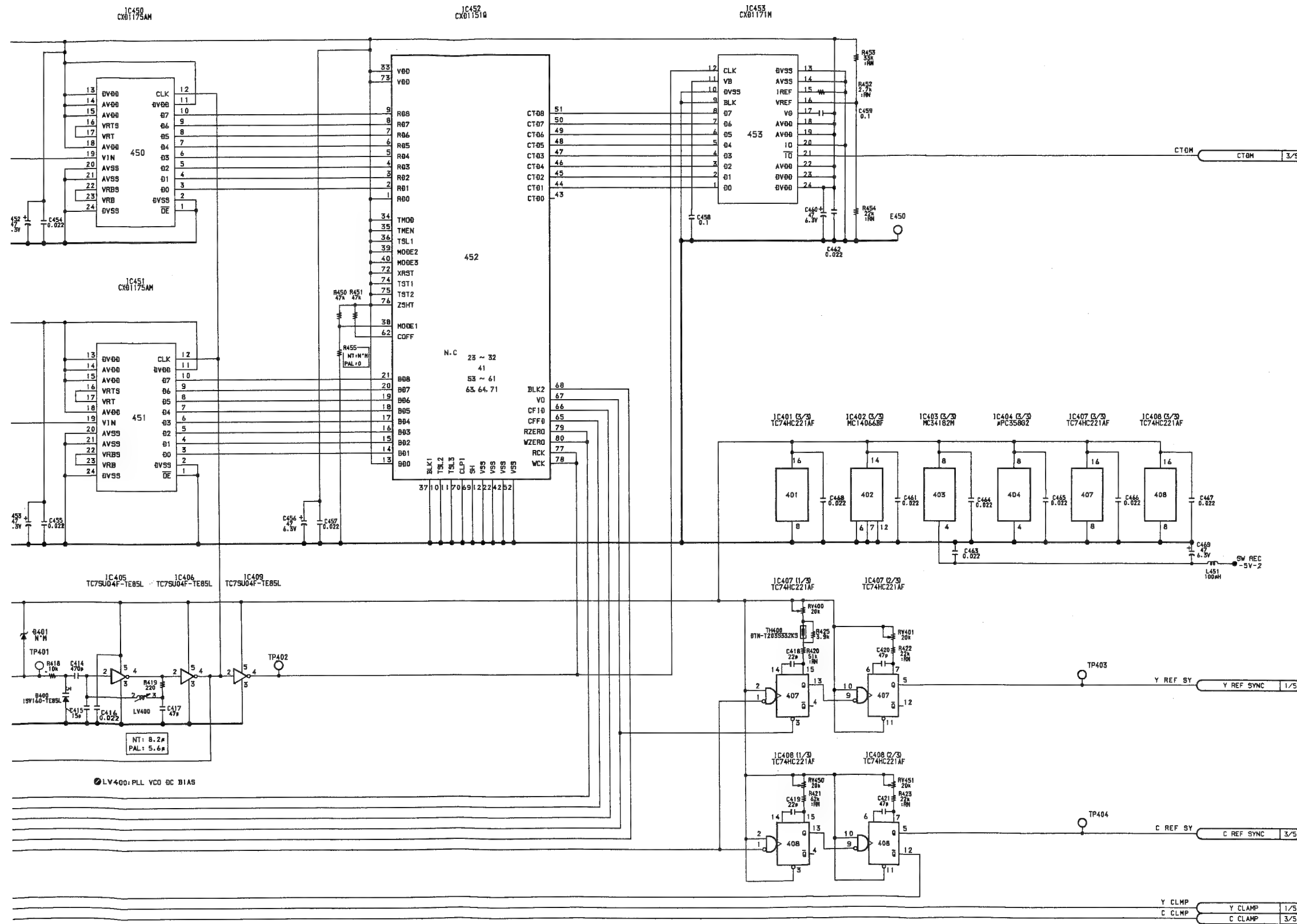
REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

VO-34P BOARD (2/5)

Y Modulator  
Y REC Amplifier

S/N 11421 through 12390





**VO-34P BOARD (2/5)**  
1-640-269-14  
PVV-1P (EK) ; #11421-#12390

●RV400:Y REF SYNC POSITION ●RV401:Y REF SYNC PULSE WIDTH  
●RV450:C REF SYNC POSITION ●RV451:C REF SYNC PULSE WIDTH

1  
2  
3  
4  
5



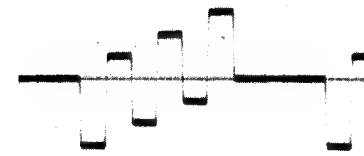
VO-34P (2/5)

S/N 12391 and higher

CN1-1 pin R-Y 700mVp-p REC mode



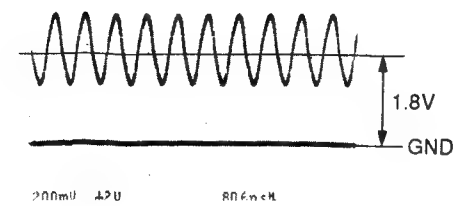
CN1-3 pin B-Y 700mVp-p REC mode



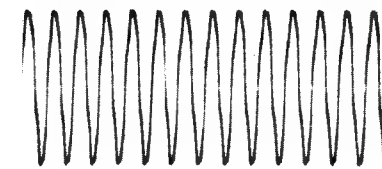
■ TP300 R-Y 1.45Vp-p REC mode



■ TP350 B-Y 1.45Vp-p REC mode

■ TP401 PLL VCO REC mode  
A1 1.75 V

■ TP402 R-CK 6Vp-p REC mode



■ TP403 Y REF SYNC 5Vp-p REC mode



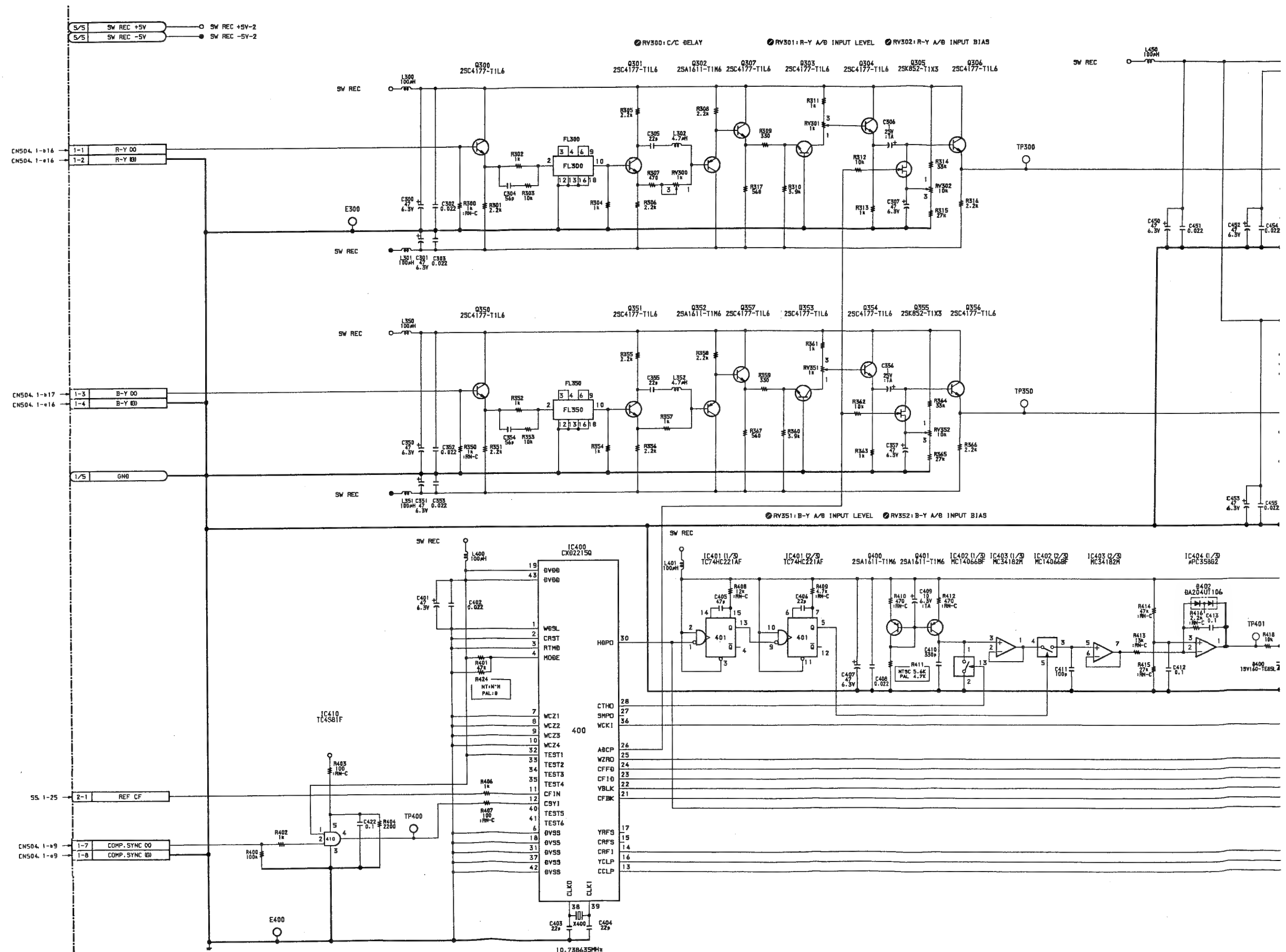
■ TP404 C REF SYNC 5Vp-p REC mode

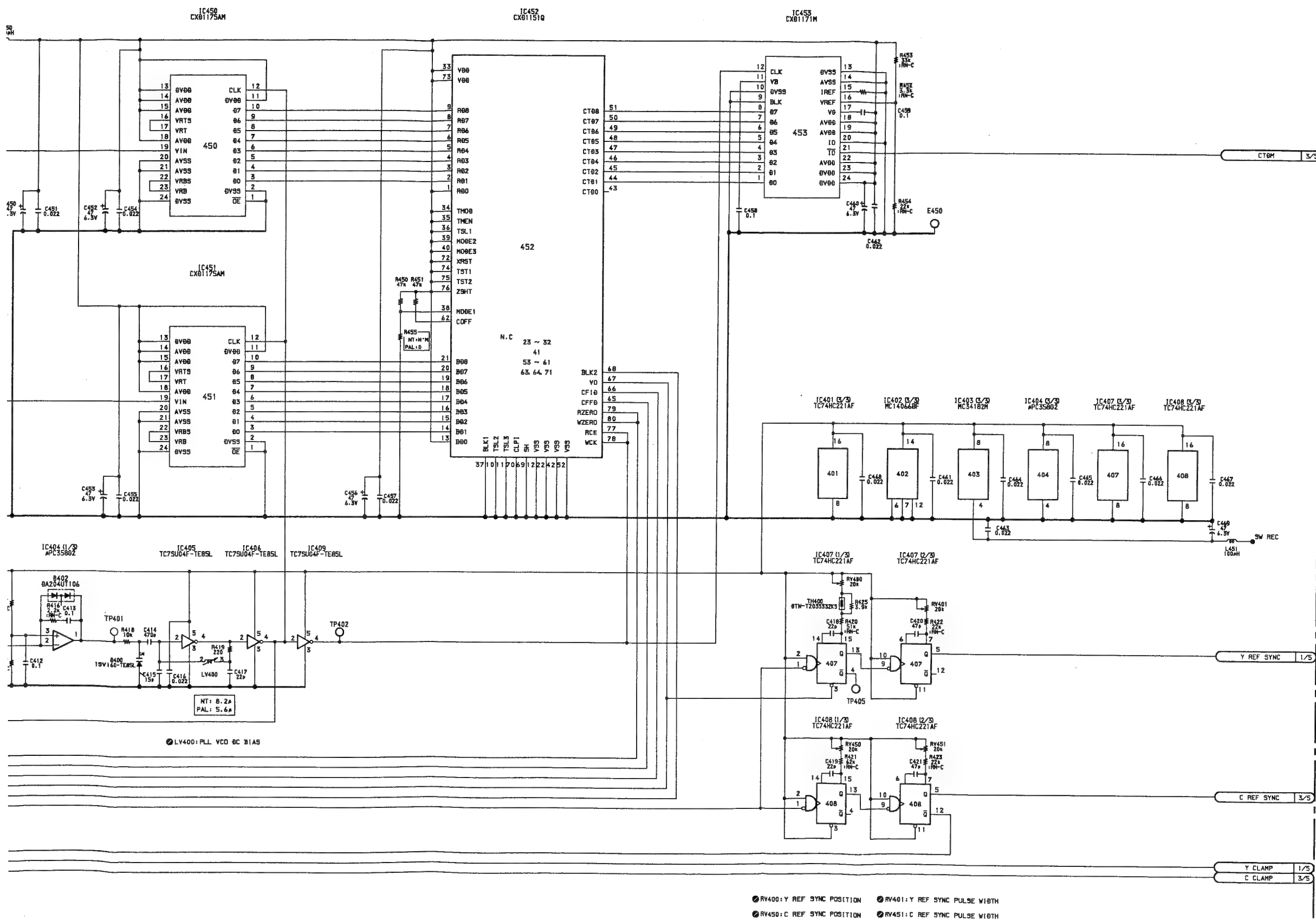


REC mode.....Record the 100 % color bars signal.  
 PB mode.....Play back the color bars signal portion  
 of the alignment tape CR5-1B PS.

**VO-34P BOARD (2/5)**  
Y Modulator  
Y REC Amplifier

S/N 12391 and higher





VO-34P BOARD (2/5)

1-640-269-15  
PVV-1P (EK) ; #12391-

V0-34P (3/5)

S/N 10001 through 10100

① ■ TP505 CTDM 1.45Vp-p REC mode



④ ■ TP501 REC mode



⑧ ■ TP600 C-FM 440mVp-p REC mode



⑪ IC561-4 pin AFM PILOT 5Vp-p REC mode



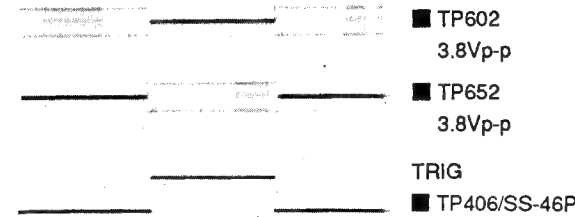
② ■ TP500 CTDM 715mVp-p REC mode



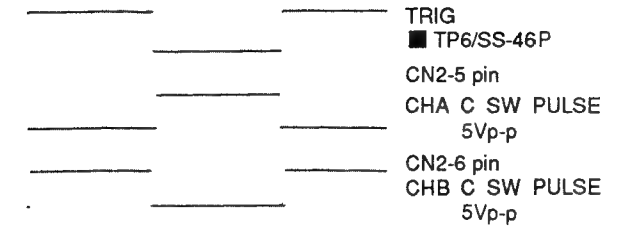
⑤ ■ TP503 45mVp-p REC mode



⑨ REC mode



⑫ REC mode



③ IC500-2 pin CTDM REC mode



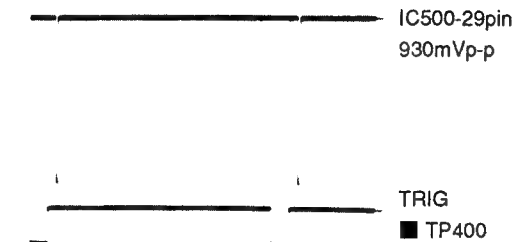
⑥ ■ TP507 REC mode



⑩ IC560-4 pin AFM PILOT 5Vp-p REC mode



⑬ REC mode



⑦ ■ TP502 REC mode

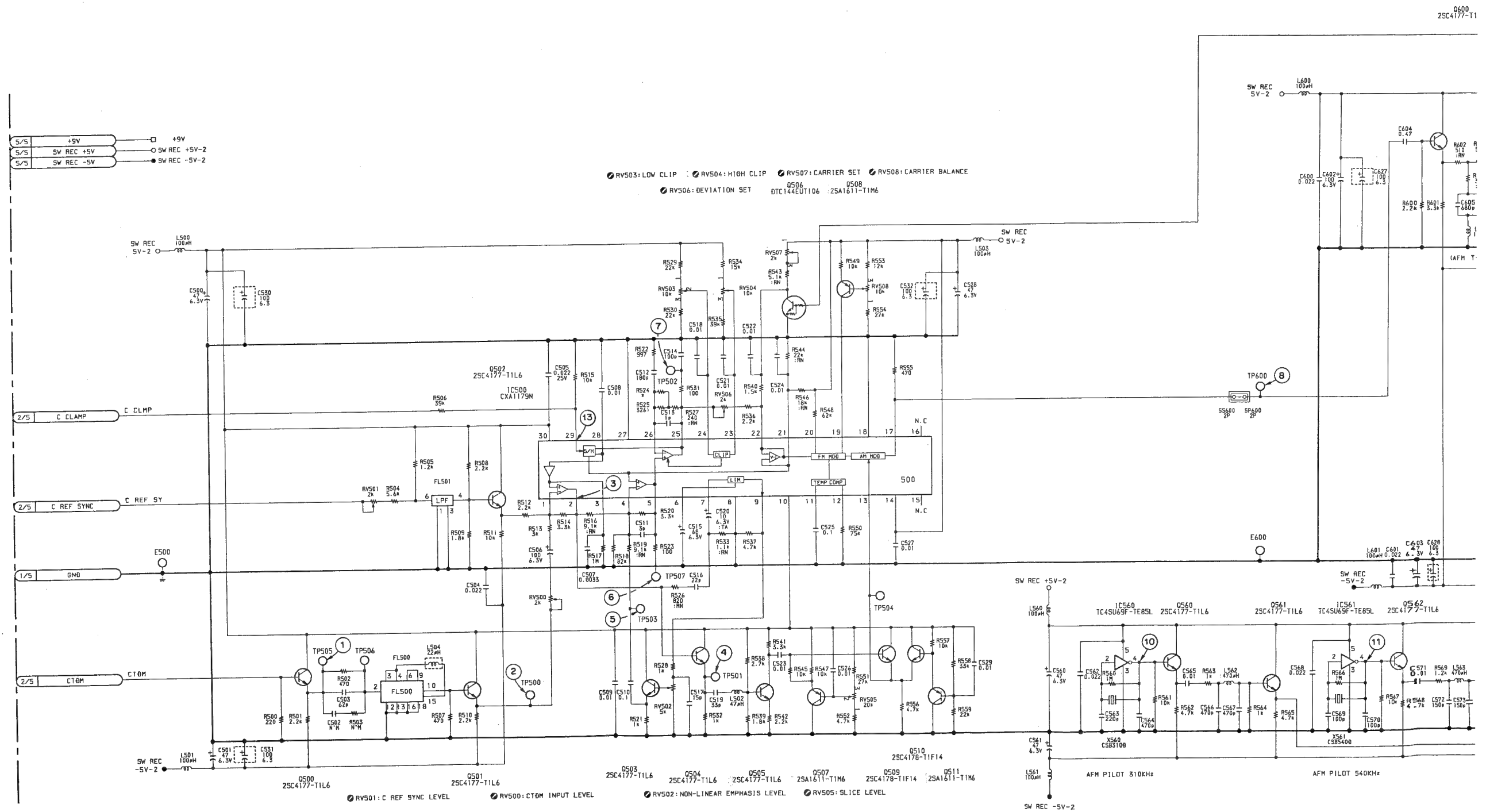


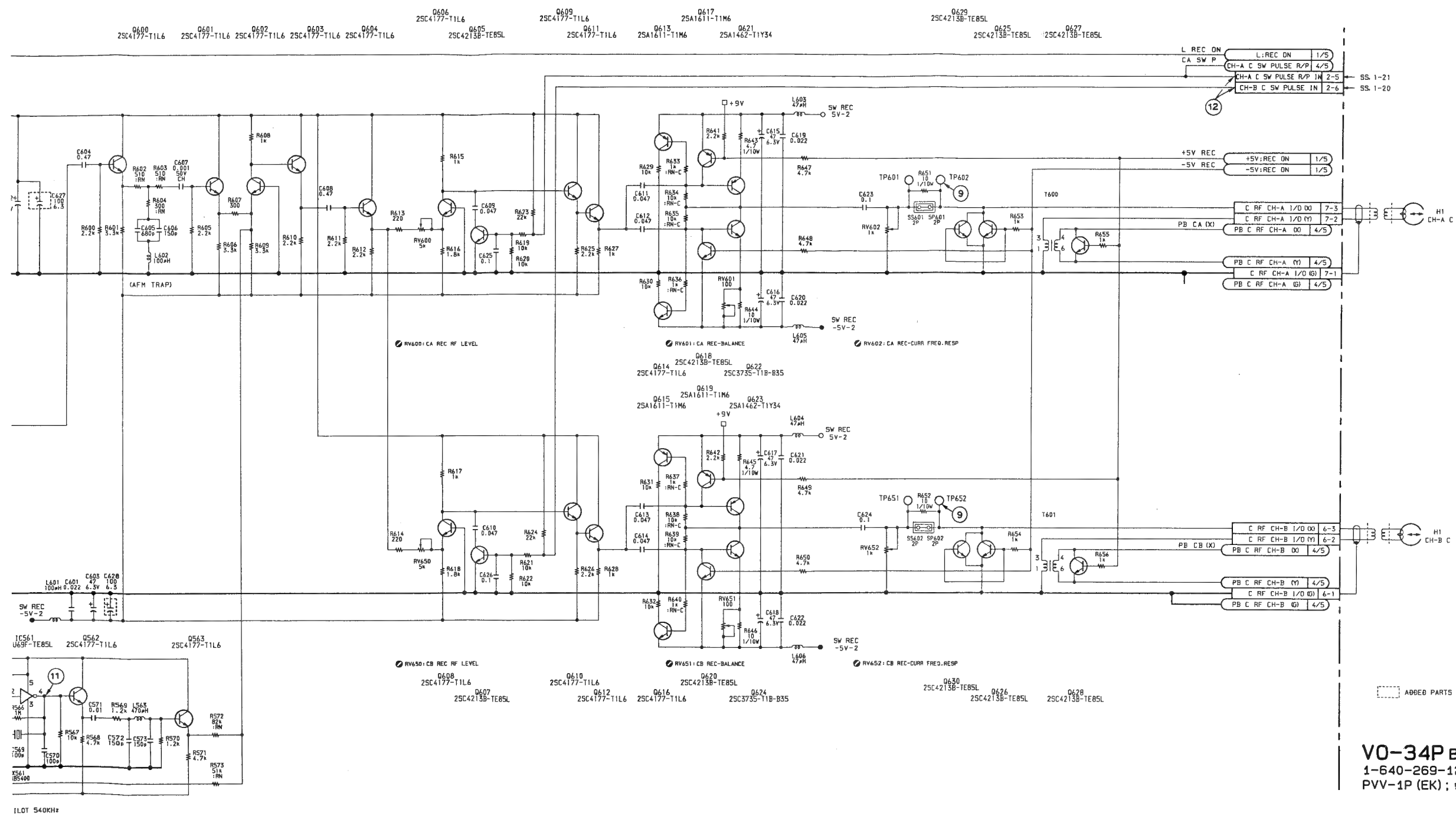
REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

V0-34P BOARD (3/5)

C Modulator  
C REC Amplifier  
AFM Pilot Oscillator

S/N 10001 through 10100





VO-34P BOARD (3/5)  
1-640-269-12  
PVV-1P (EK); #10001-10100

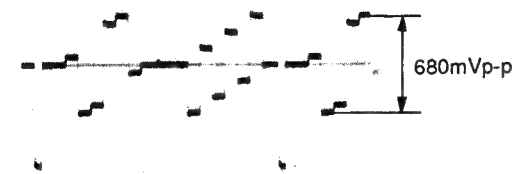
V0-34P (3/5)

S/N 10101 through 11420

① ■ TP505 CTDM 1.45Vp-p REC mode



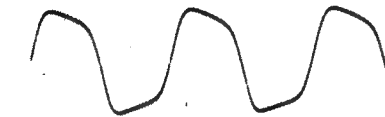
④ ■ TP501 REC mode



⑧ ■ TP600 C-FM 440mVp-p REC mode



⑪ IC561-4 pin AFM PILOT 5Vp-p REC mode



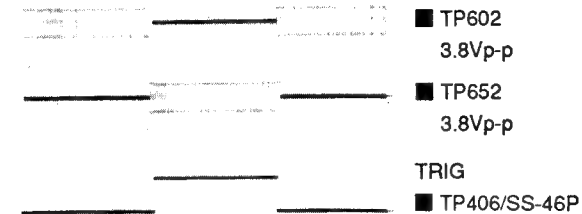
② ■ TP500 CTDM 715mVp-p REC mode



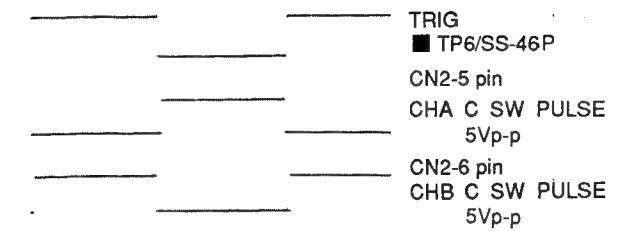
⑤ ■ TP503 45mVp-p REC mode



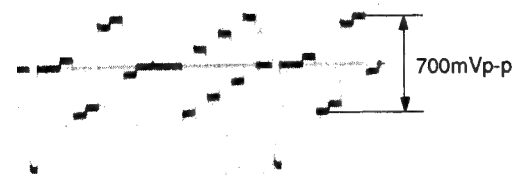
⑨ REC mode



⑫ REC mode



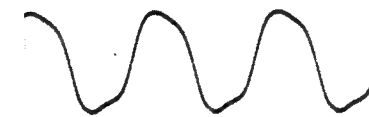
③ IC500-2 pin CTDM REC mode



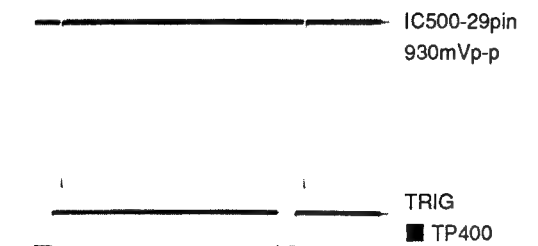
⑥ ■ TP507 REC mode



⑩ IC560-4 pin AFM PILOT 5Vp-p REC mode



⑬ REC mode



⑦ ■ TP502 REC mode

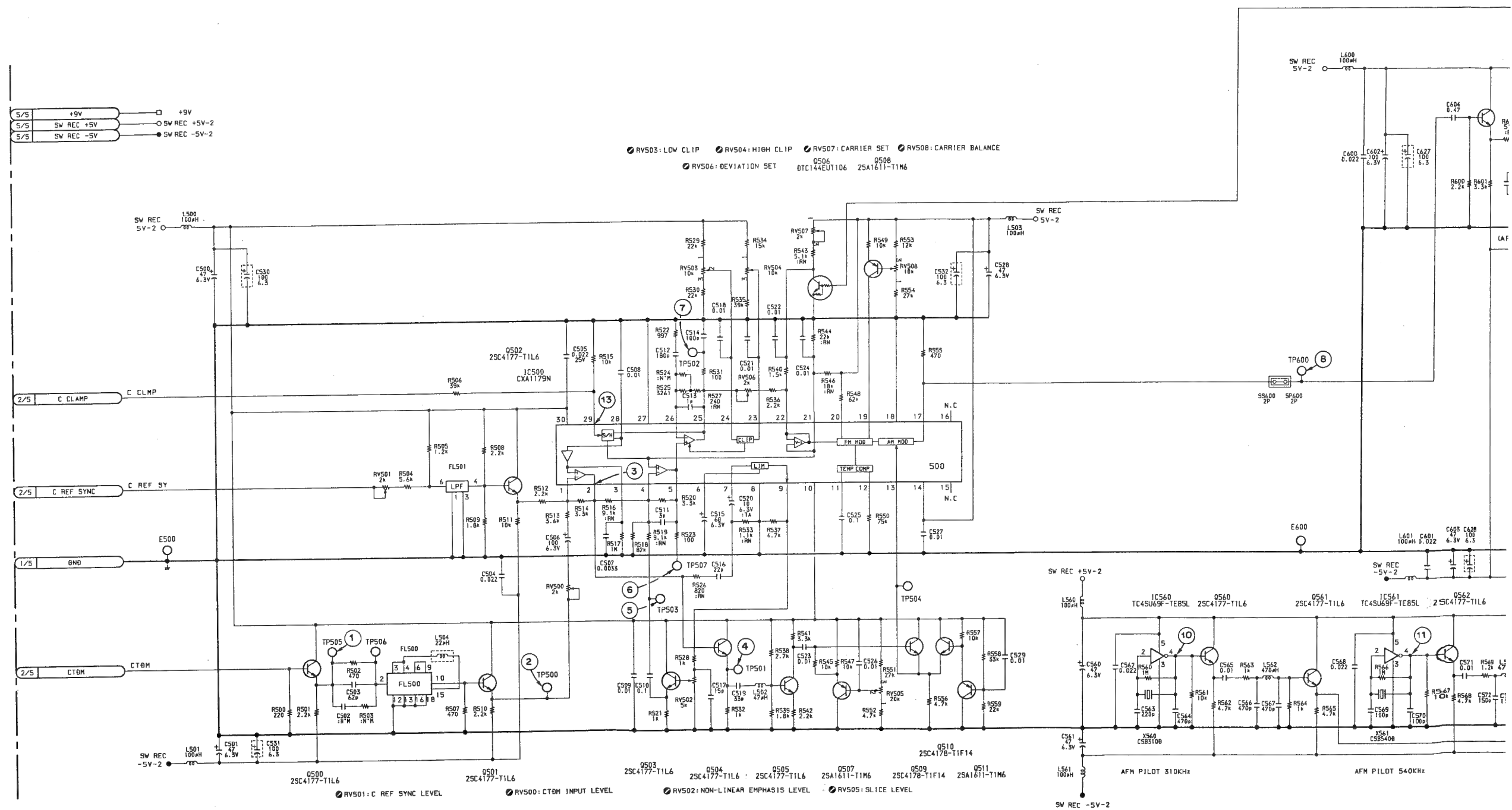


REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

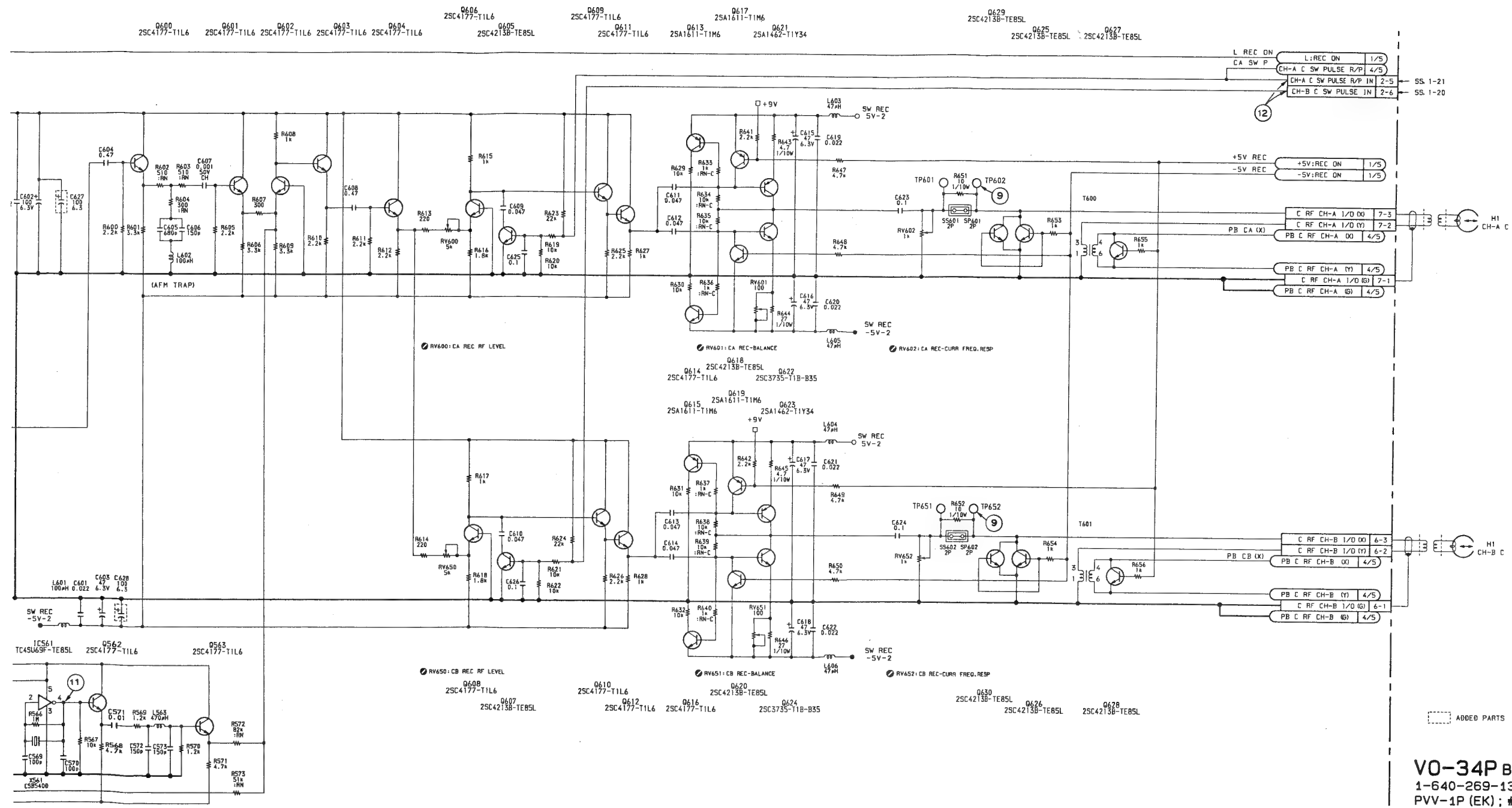
**V0-34P BOARD (3/5)**

C Modulator  
C REC Amplifier  
AFM Pilot Oscillator

S/N 10101 through 11420







V0-34P BOARD (3/5)  
1-640-269-13  
PVV-1P (EK) ; #10101-11420

FM PILOT 540KH

11-7 (b)

11-7 (b)

11-7 (b)

V0-34P (3/5) S/N 11421 and higher

■ TP505 CTDM 1.45Vp-p REC mode



■ TP501 REC mode



■ TP600 C-FM 440mVp-p REC mode



IC561-4 pin AFM PILOT 5Vp-p REC mode



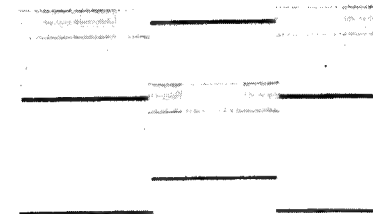
■ TP500 CTDM 715mVp-p REC mode



■ TP503 45mVp-p REC mode



REC mode



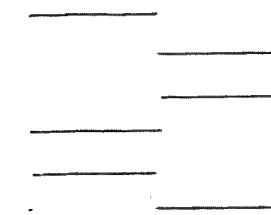
■ TP602 3.8Vp-p

■ TP652 3.8Vp-p

TRIG

■ TP406/SS-46P

REC mode



TRIG

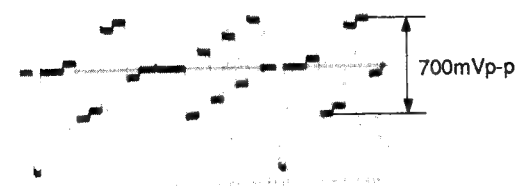
■ TP6/SS-46P

CN2-5 pin

CHA C SW PULSE 5Vp-p

CN2-6 pin CHB C SW PULSE 5Vp-p

IC500-2 pin CTDM REC mode



■ TP507 REC mode



IC560-4 pin AFM PILOT 5Vp-p REC mode



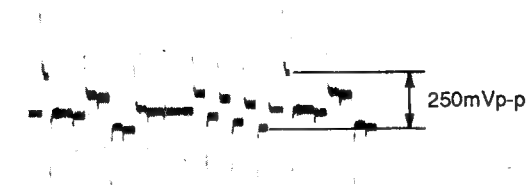
REC mode

IC500-29pin 930mVp-p

TRIG

■ TP400

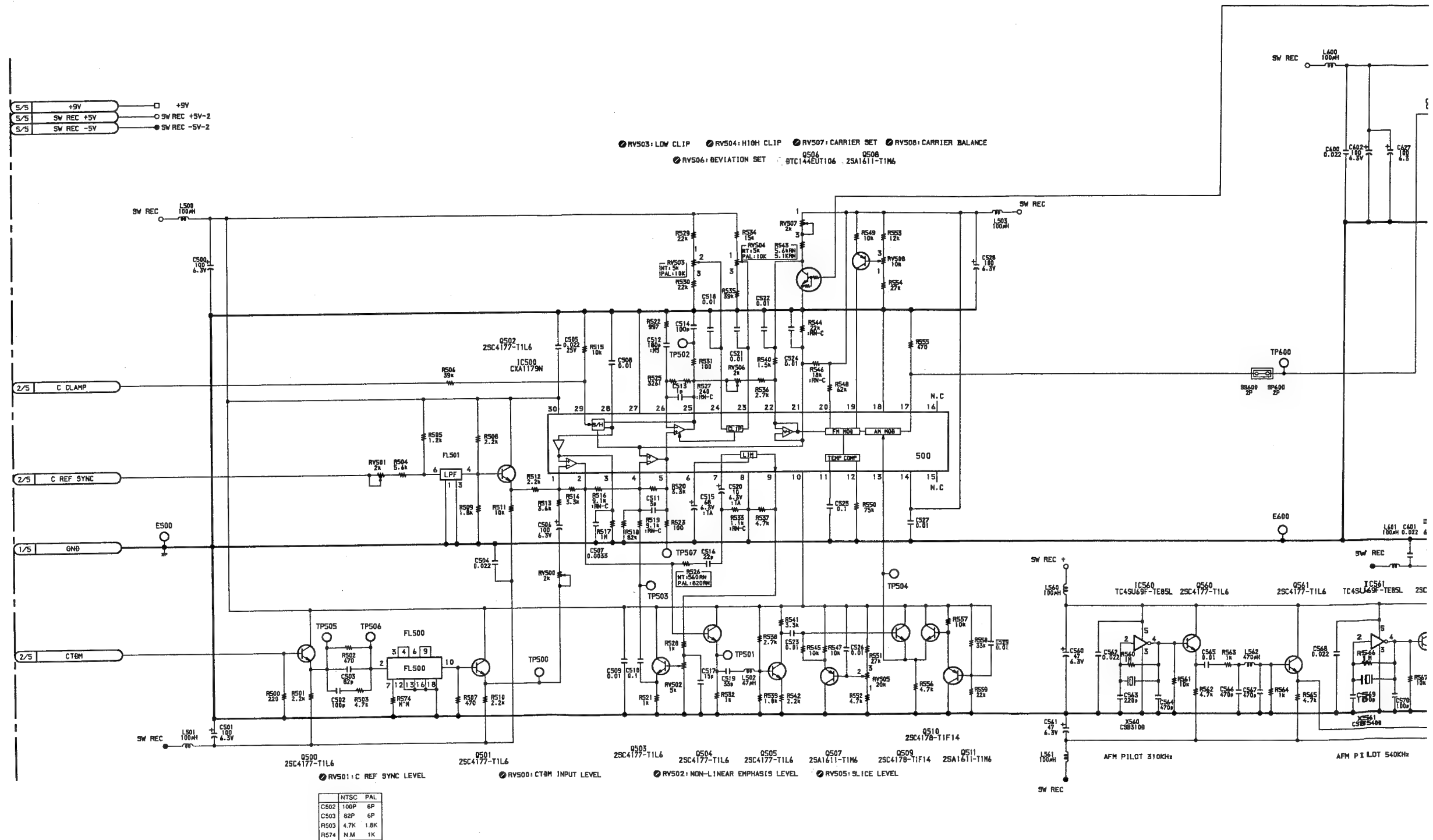
■ TP502 REC mode

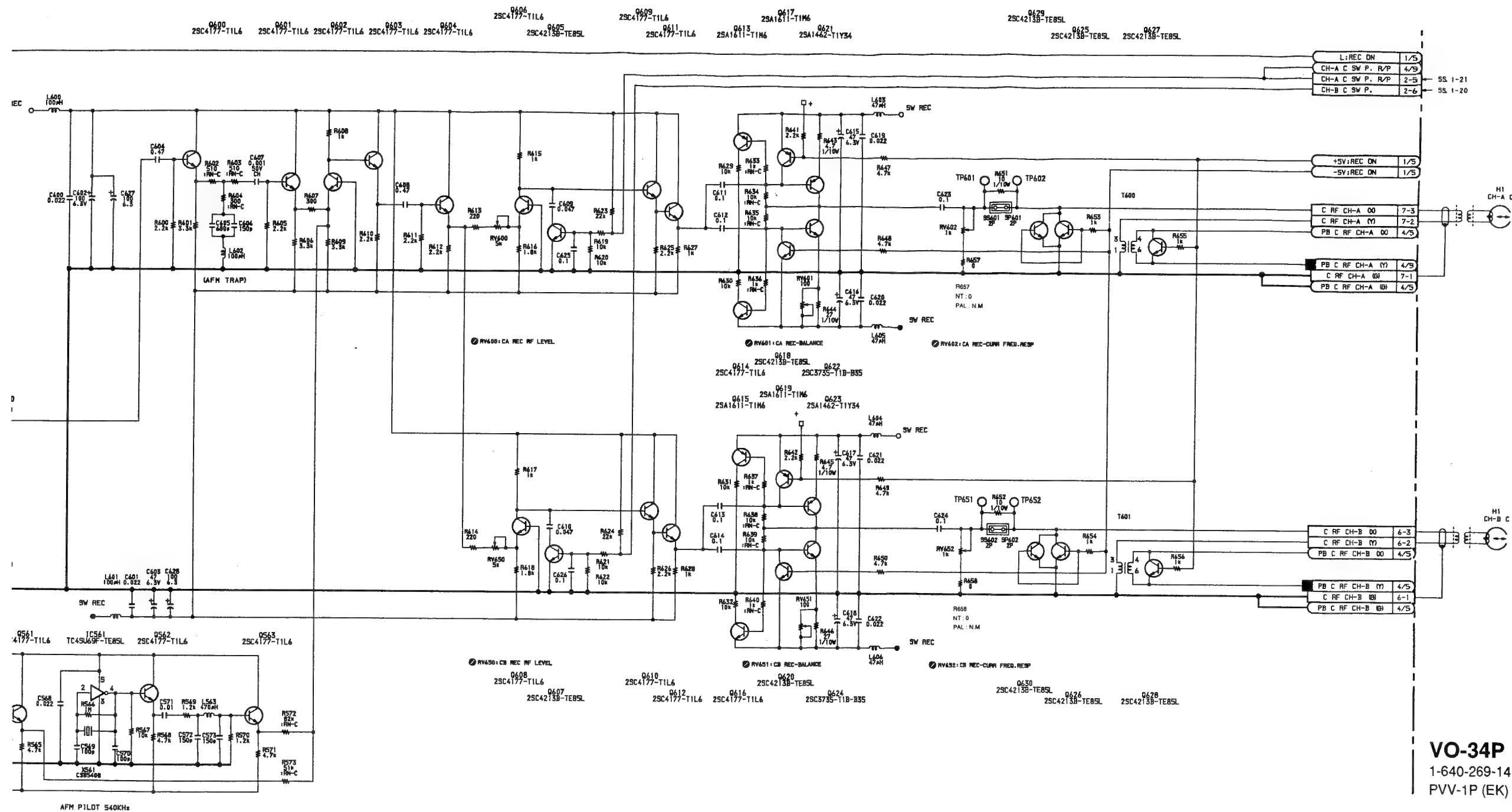


REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

VO-34P BOARD (3/5)  
Y Modulator  
Y REC Amplifier

S/N 11421 and higher



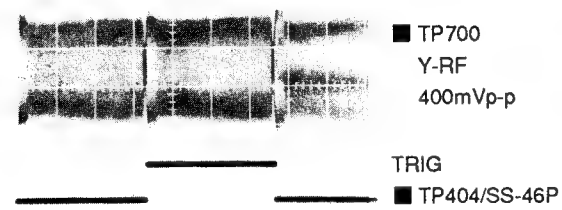


**VO-34P BOARD (3/5)**  
1-640-269-14, 15  
PVV-1P (EK) ; #11421-

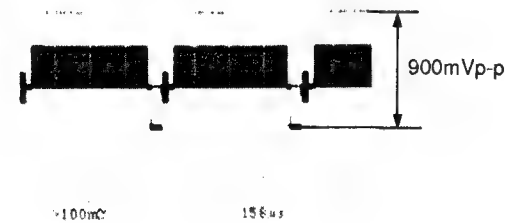
1  
2  
3  
4  
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V0-34P (4/5) S/N 10001 through 10100

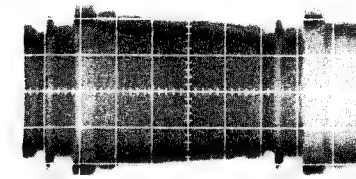
① PB mode



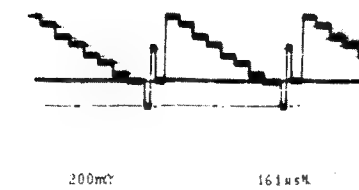
④ CN2-3 pin CHARACTER VIDEO DIAG mode



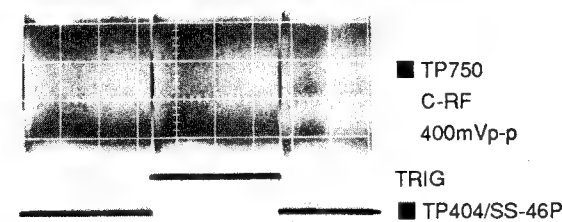
⑦ IC801-48 pin PB RF 150mVp-p PB mode



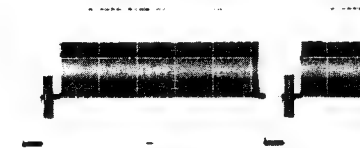
⑪ IC801-37 pin 500mVp-p PB mode



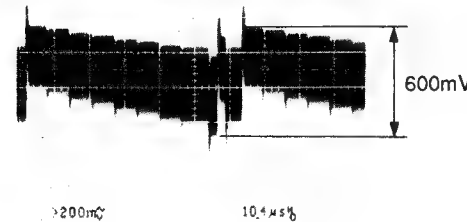
② PB mode



⑤ TP851 680mVp-p DIAG mode



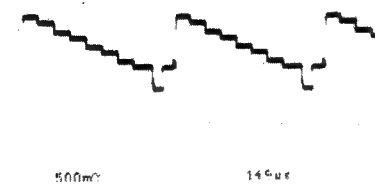
⑧ IC801-12 pin DEMOD OUTPUT PB mode



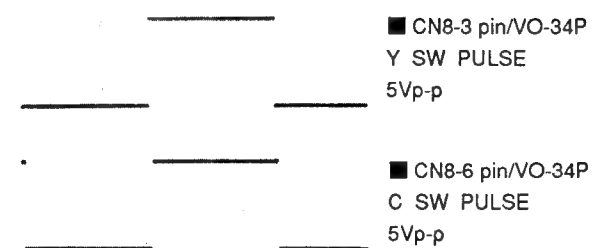
⑫ IC801-5 pin CLAMP PULSE 2Vp-p PB mode



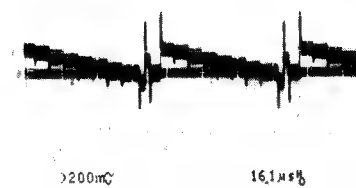
③ TP800 PB VIDEO 1Vp-p PB mode



⑥ CN8-3 pin and CN8-6 pin PB mode



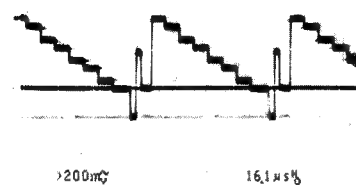
⑨ IC801-40 pin 700mVp-p PB mode



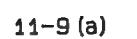
⑬ IC801-6 pin 5.5Vp-p PB mode

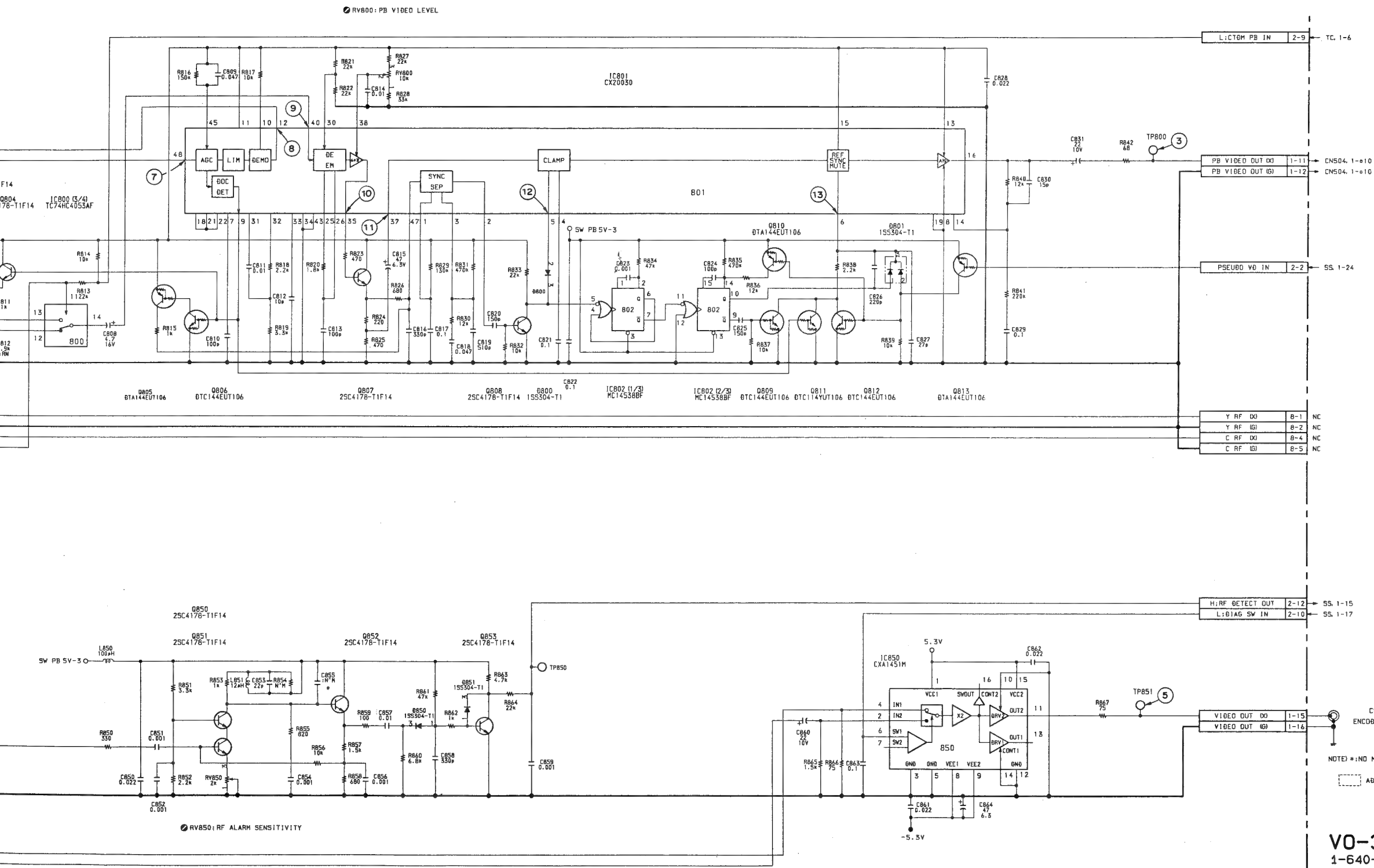


⑩ IC801-35 pin 750mVp-p PB mode



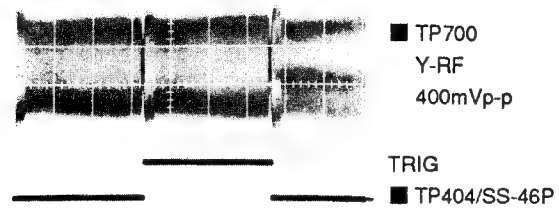
REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.



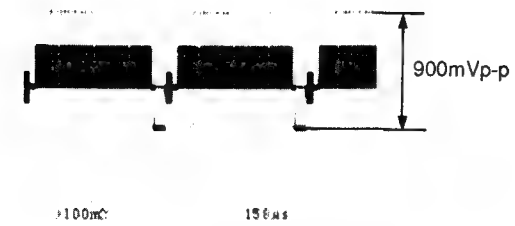


V0-34P (4/5) S/N 10101 through 11420

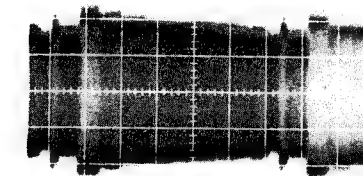
① PB mode



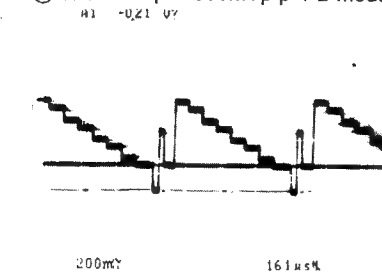
④ CN2-3 pin CHARACTER VIDEO DIAG mode



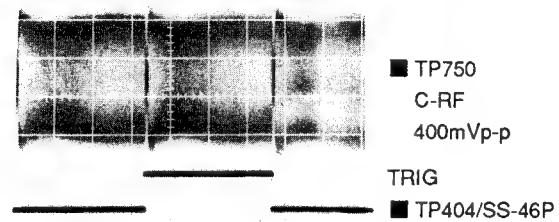
⑦ IC801-48 pin PB RF 150mVp-p PB mode



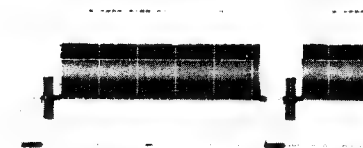
⑪ IC801-37 pin 500mVp-p PB mode



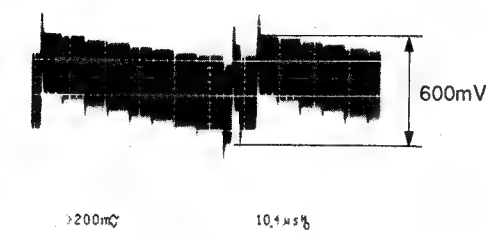
② PB mode



⑤ TP851 680mVp-p DIAG mode



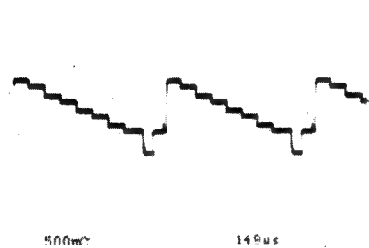
⑧ IC801-12 pin DEMOD OUTPUT PB mode



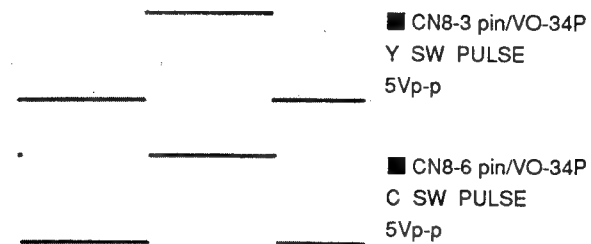
⑫ IC801-5 pin CLAMP PULSE 2Vp-p PB mode



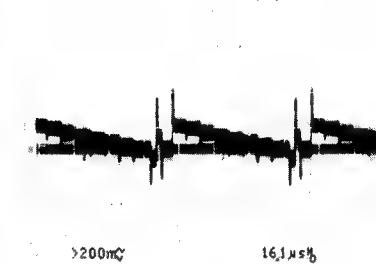
③ TP800 PB VIDEO 1Vp-p PB mode



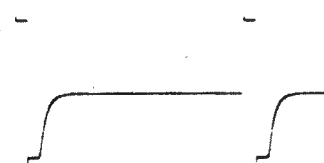
⑥ CN8-3 pin and CN8-6 pin PB mode



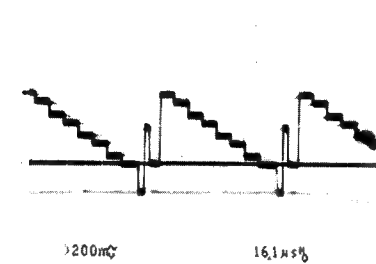
⑨ IC801-40 pin 700mVp-p PB mode



⑬ IC801-6 pin 5.5Vp-p PB mode

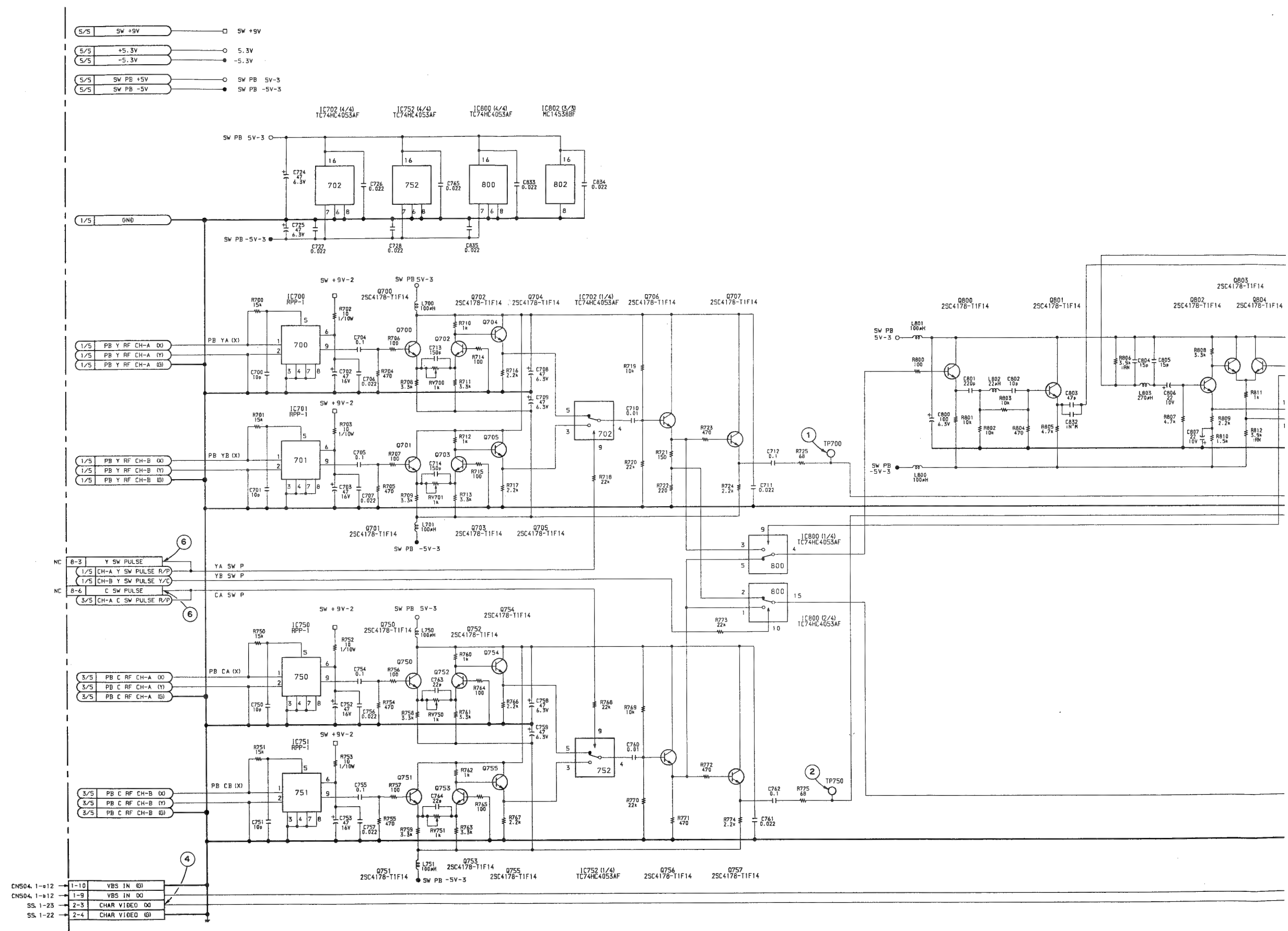


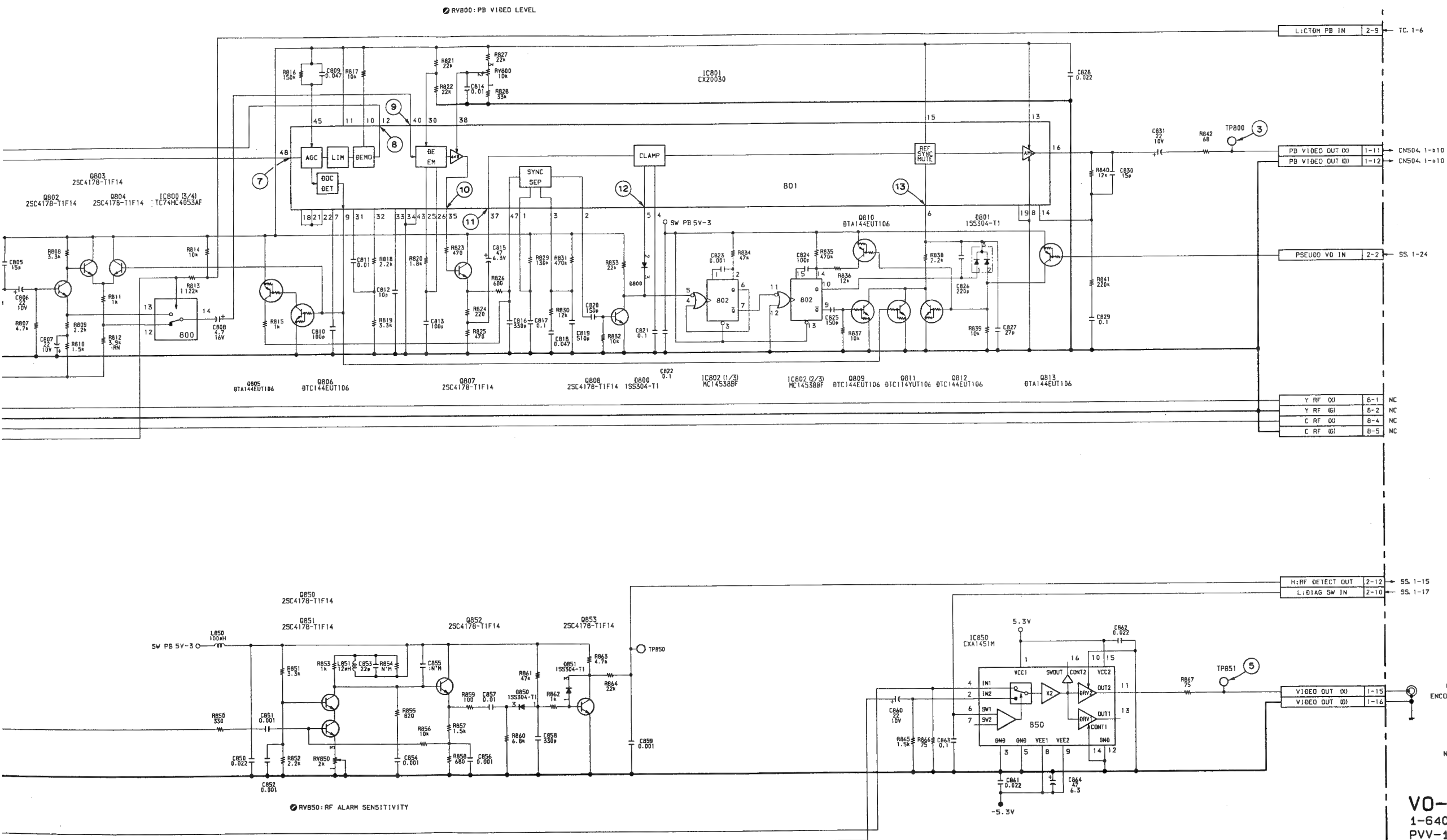
⑩ IC801-35 pin 750mVp-p PB mode



REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.







1

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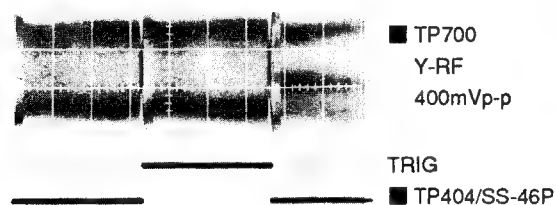
4

5

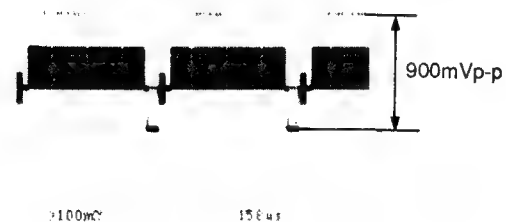
V0-34P (4/5)

S/N 11421 and higher

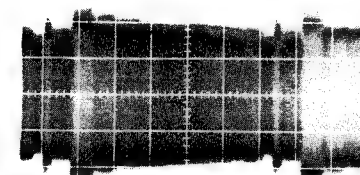
PB mode



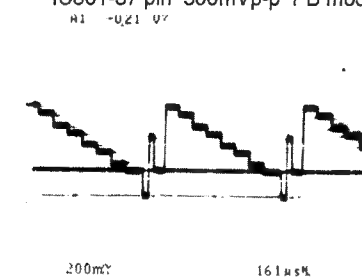
CN2-3 pin CHARACTER VIDEO DIAG mode



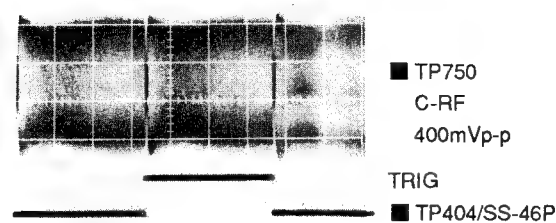
IC801-48 pin PB RF 150mVp-p PB mode



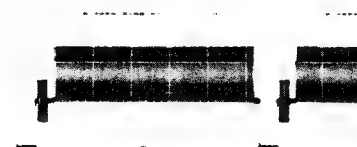
IC801-37 pin 500mVp-p PB mode



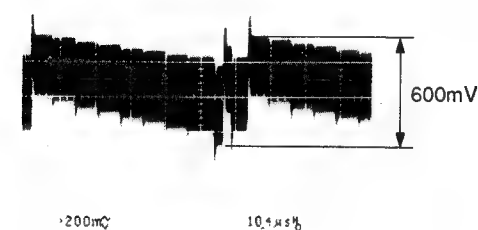
PB mode



TP851 680mVp-p DIAG mode



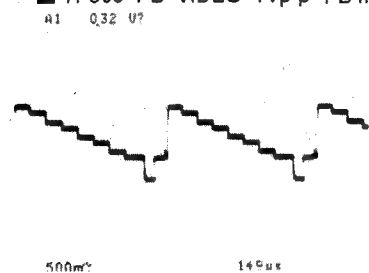
IC801-12 pin DEMOD OUTPUT PB mode



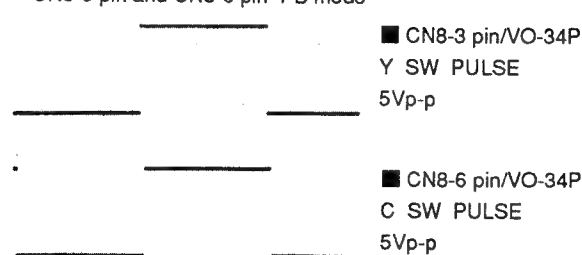
IC801-5 pin CLAMP PULSE 2Vp-p PB mode



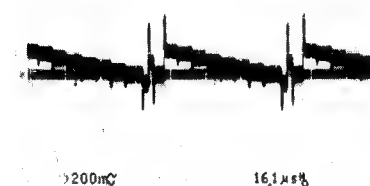
TP800 PB VIDEO 1Vp-p PB mode



CN8-3 pin and CN8-6 pin PB mode



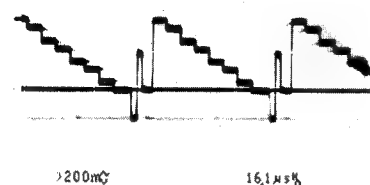
IC801-40 pin 700mVp-p PB mode



IC801-6 pin 5.5Vp-p PB mode



IC801-35 pin 750mVp-p PB mode



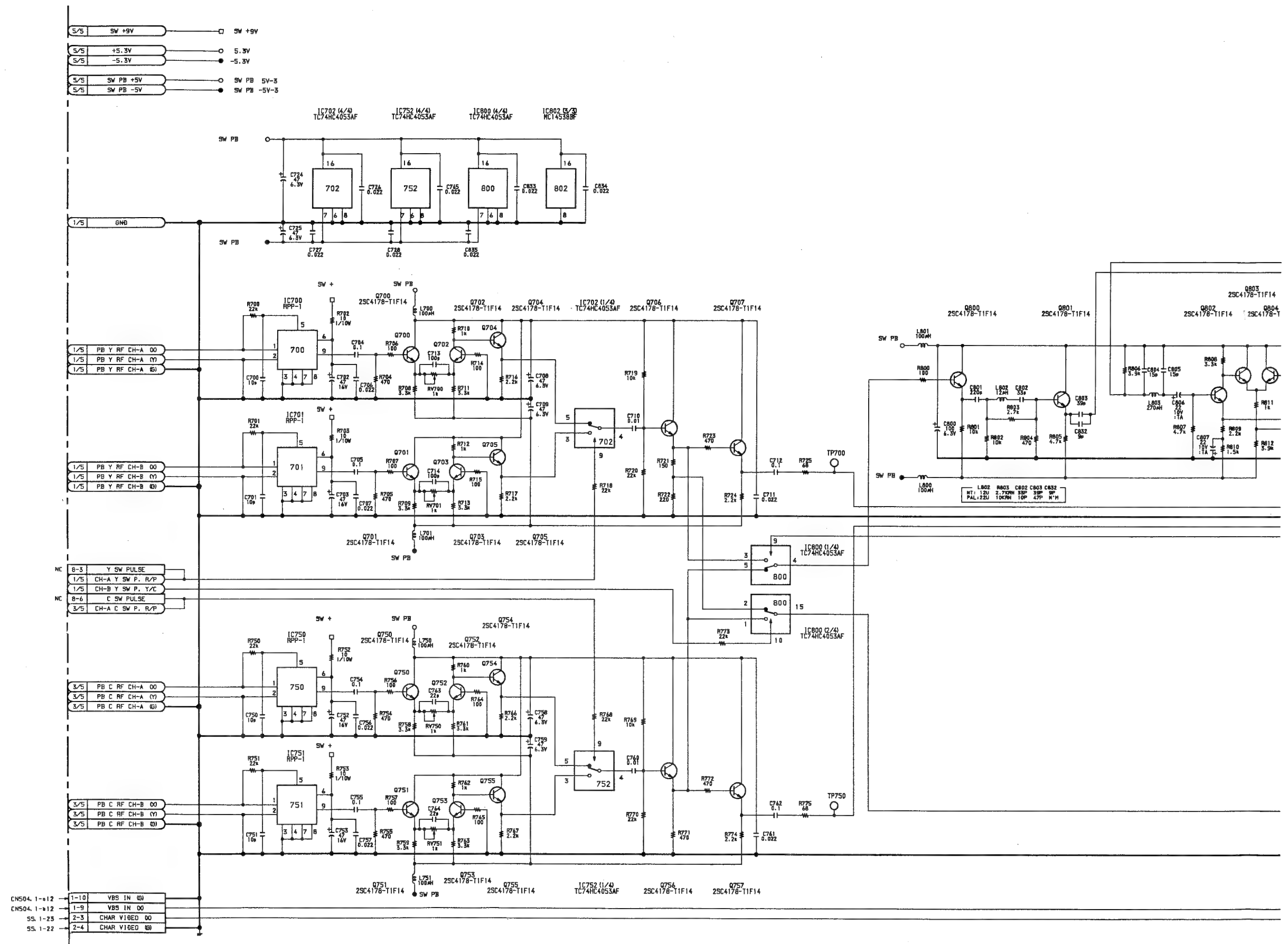
REC mode.....Record the 100 % color bars signal.  
PB mode.....Play back the color bars signal portion  
of the alignment tape CR5-1B PS.

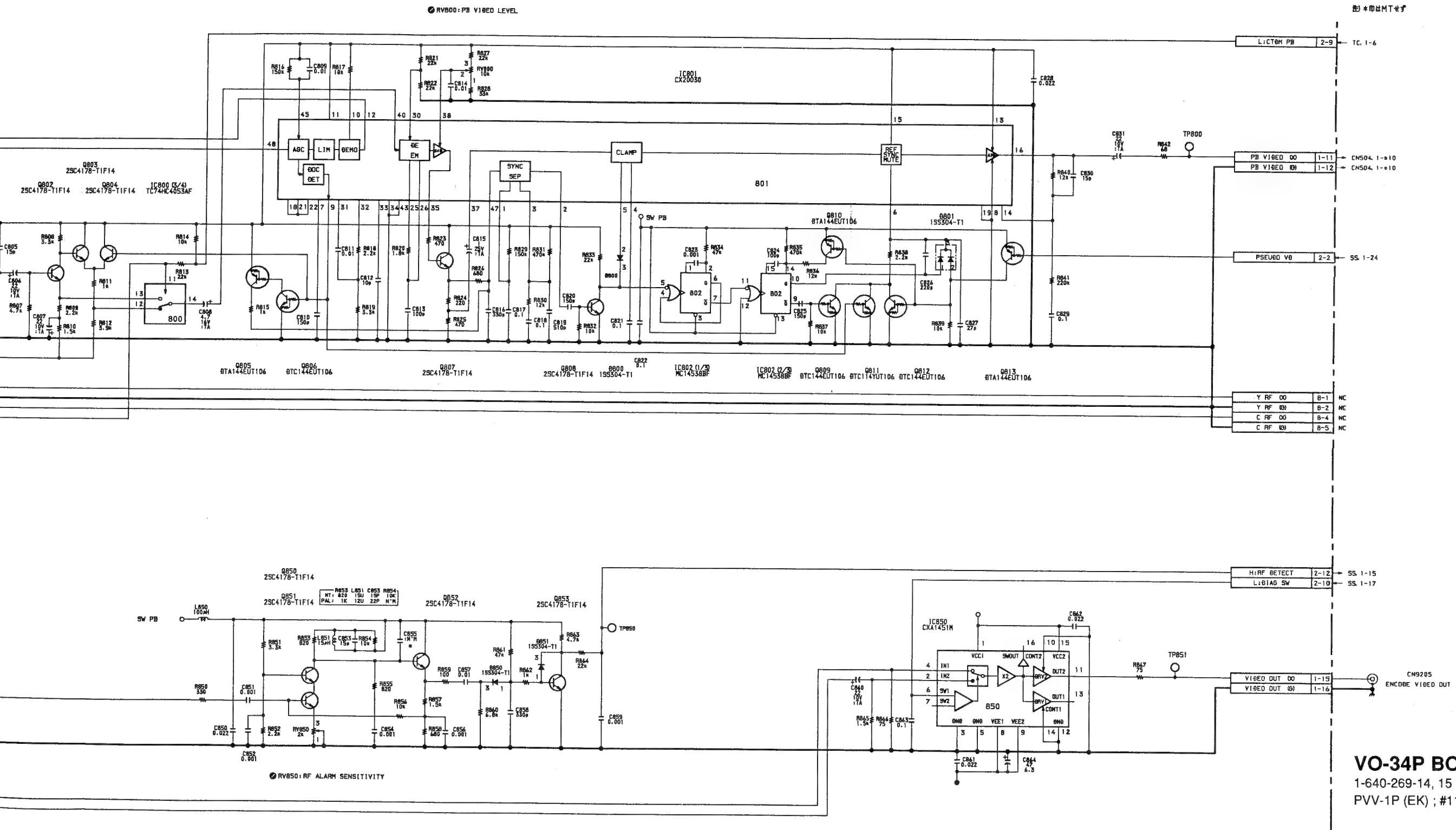
**VO-34P (4/5)**

## VO-34P BOARD (4/5)

Y Modulator  
Y REC Amplifier

S/N 11421 and higher

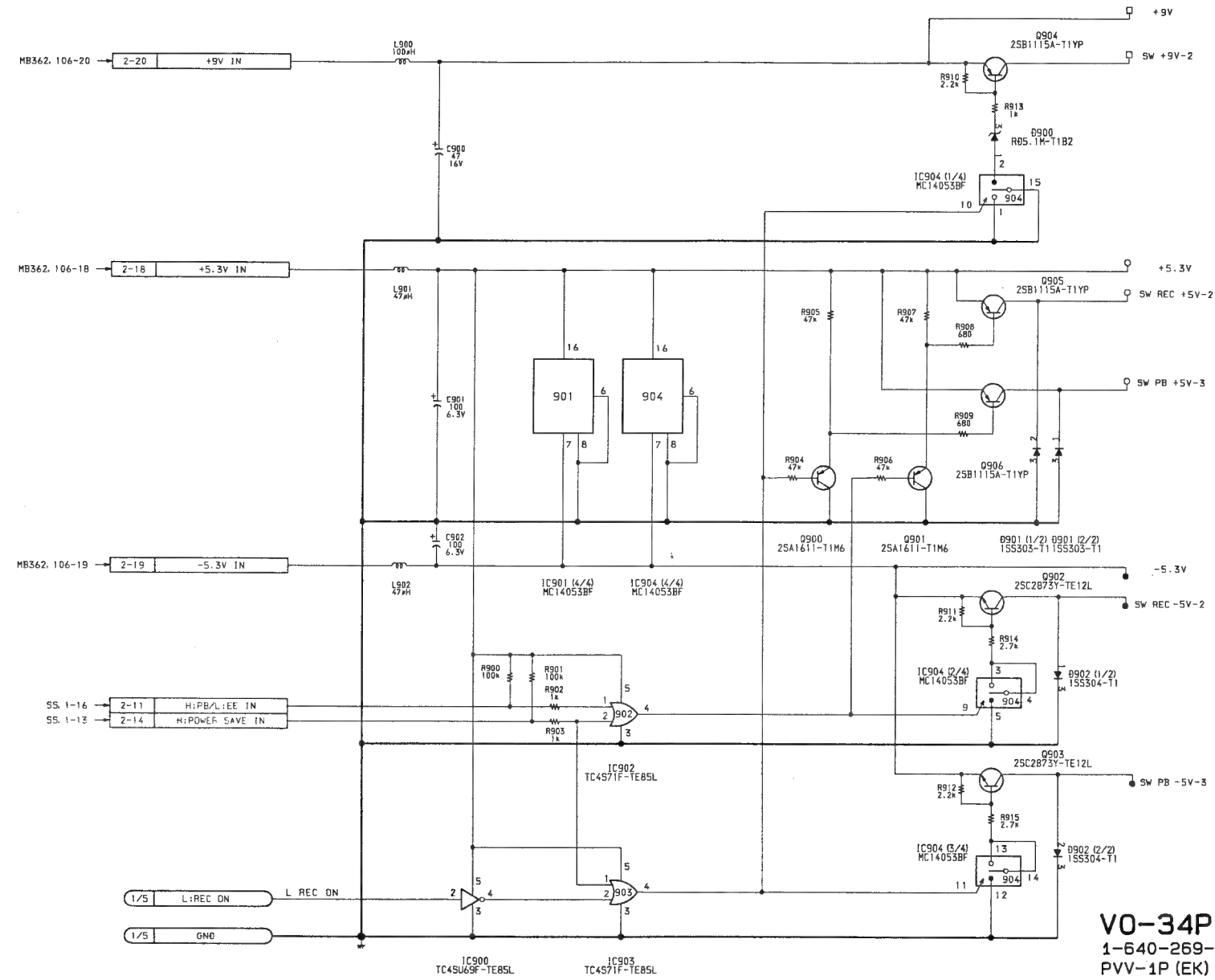




**VO-34P BOARD (4/5)**  
1-640-269-14, 15  
PVV-1P (EK) ; #11421-

V0-34P BOARD (5/5)  
Video REC/PB SW

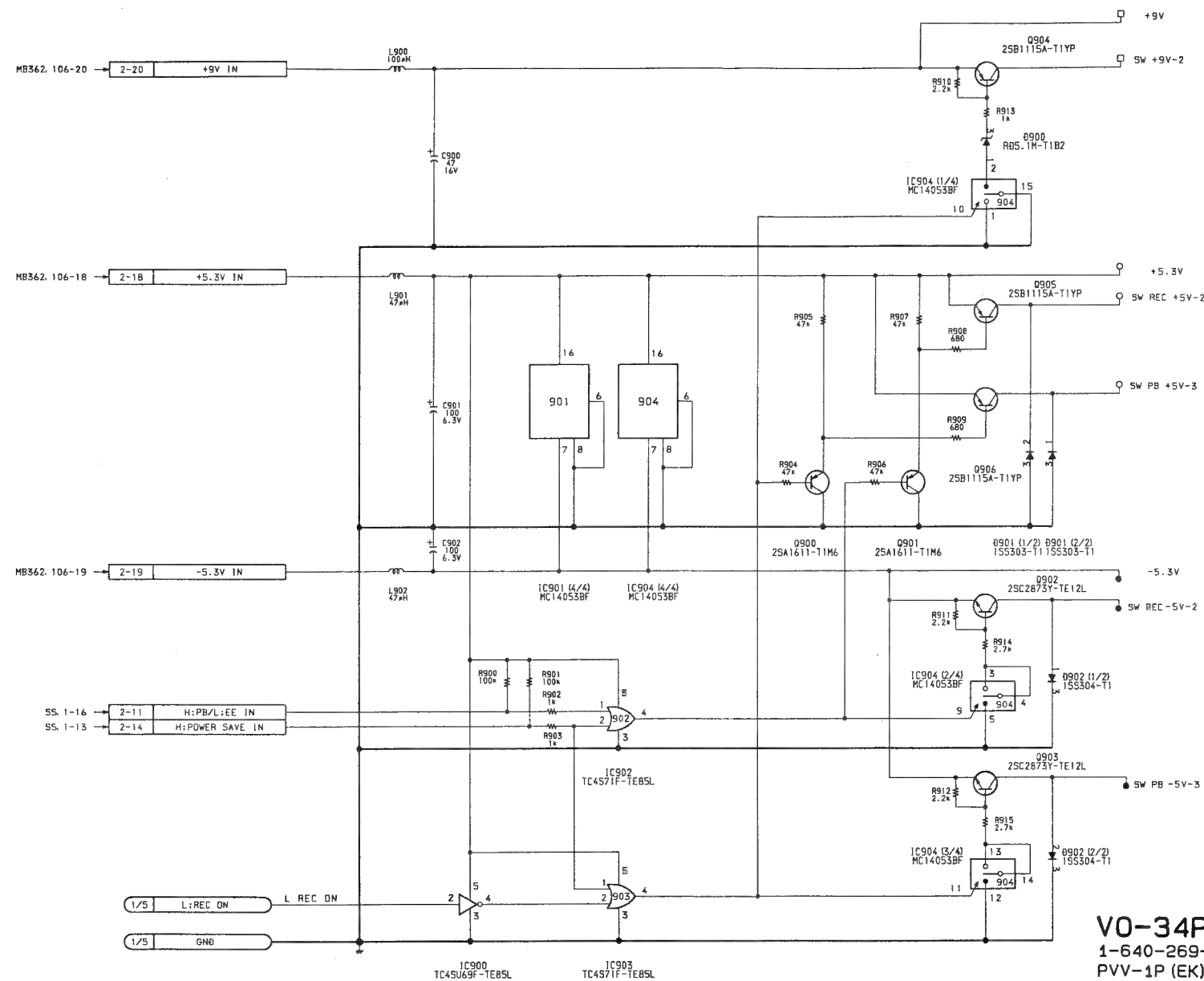
S/N 10001 through 10100



V0-34P BOARD (5/5)  
1-640-269-12  
PVV-1P (EK); #10001-10100

V0-34P BOARD (5/5)  
Video REC/PB SW

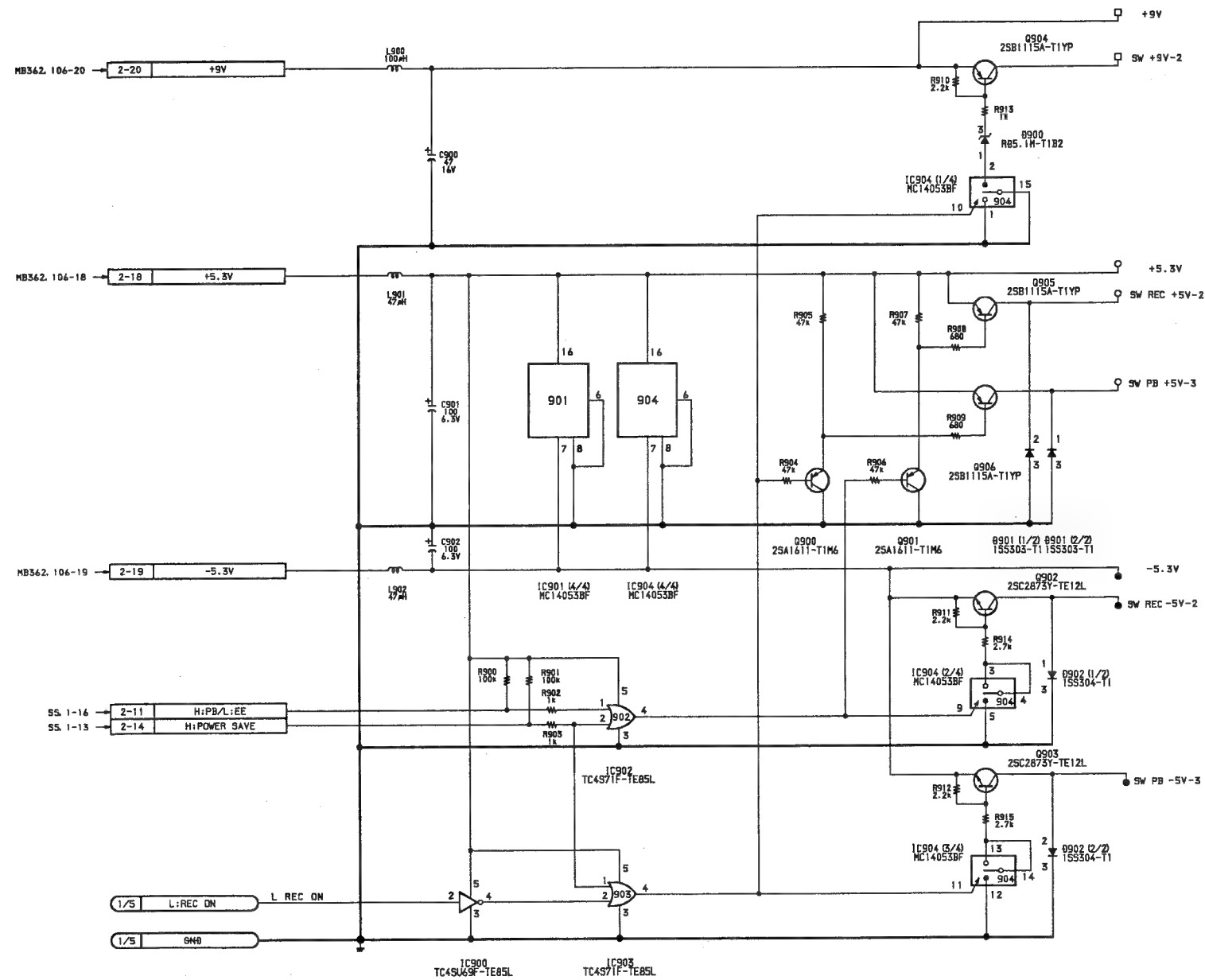
S/N 10101 through 11420



V0-34P BOARD (5/5)  
1-640-269-13  
PVV-1P (EK) ; #10101-11420

**VO-34P BOARD (5/5)**  
Y Modulator  
Y REC Amplifier

S/N 11421 and higher



**VO-34P BOARD (5/5)**

1-640-269-14, 15  
PVV-1P (EK) ; #11421-



DUS-489 BOARD

B Side



DUS-489

-B SIDE-  
1-641-894-11  
PVV-1  
PVV-1P

AU-144/P (1-640-271-11)

CN1	A-2	RV101	B-2
CN2	G-2	RV111	F-2
CN3	E-1	RV112	F-2
CN4	B-1	RV113	F-2
CN5	G-1	RV201	B-2
CN6	D-1	RV211	F-2
		RV212	G-2
CV131	F-1	RV302	C-1
CV231	F-1	RV303	C-1
		RV402	C-1
		RV403	C-1
D1	D-1 (B)		
E1	G-1	S1	B-2
E2	E-1		
E3	E-1	TP2	G-1
		TP101	E-2
		TP102	F-2
		TP201	E-2
IC1	G-2	TP202	F-1
IC2	C-2	TP301	D-1
IC111	F-2	TP302	D-1
IC112	F-2	TP303	A-1
IC301	C-1	TP401	D-1
IC302	C-1	TP402	D-1
IC303	B-1	TP403	A-1
IC501	A-2		
IC502	A-2		
IC503	B-2		
IC504	A-2	T1	F-1
IC602	A-2	T2	G-1
IC603	A-2		
LV111	F-2		
LV131	F-1		
LV211	G-2		
LV231	G-1		

Q1	G-2 (B)
Q2	G-2 (B)
Q3	D-1
Q4	E-1
Q5	F-1 (B)
Q12	F-1 (B)
Q14	G-1 (B)
Q15	G-1 (B)
Q16	G-2 (B)
Q17	G-2 (B)
Q50	G-1 (B)
Q51	G-1 (B)
Q54	B-1 (B)
Q55	C-1
Q56	D-1 (B)
Q57	B-1
Q58	C-1 (B)
Q59	E-1
Q60	F-1
Q131	G-2 (B)
Q132	F-1
Q231	G-2 (B)
Q232	F-2
Q302	B-1 (B)
Q305	E-1 (B)
Q306	D-1 (B)
Q307	D-1 (B)
Q402	C-1 (B)
Q405	D-1 (B)
Q406	D-1 (B)
Q407	D-1 (B)

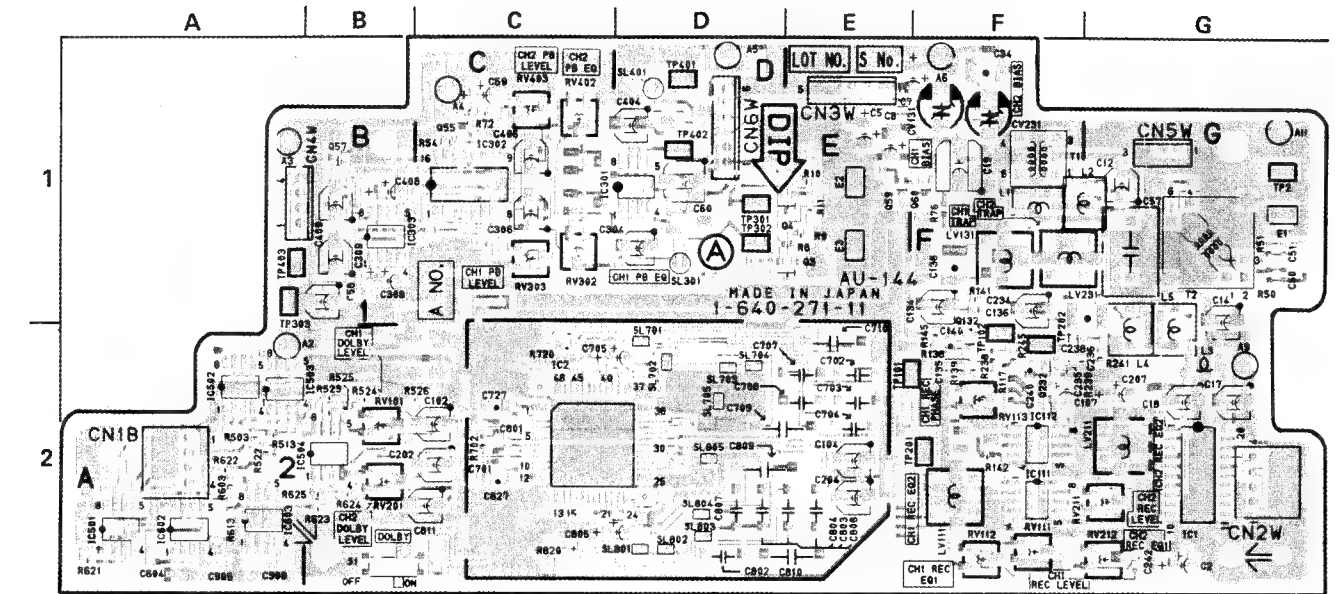
NOTE  
\* : \*--A SIDE  
\*(B) : \*--B SIDE

AU-144P BOARD

Audio REC/PB

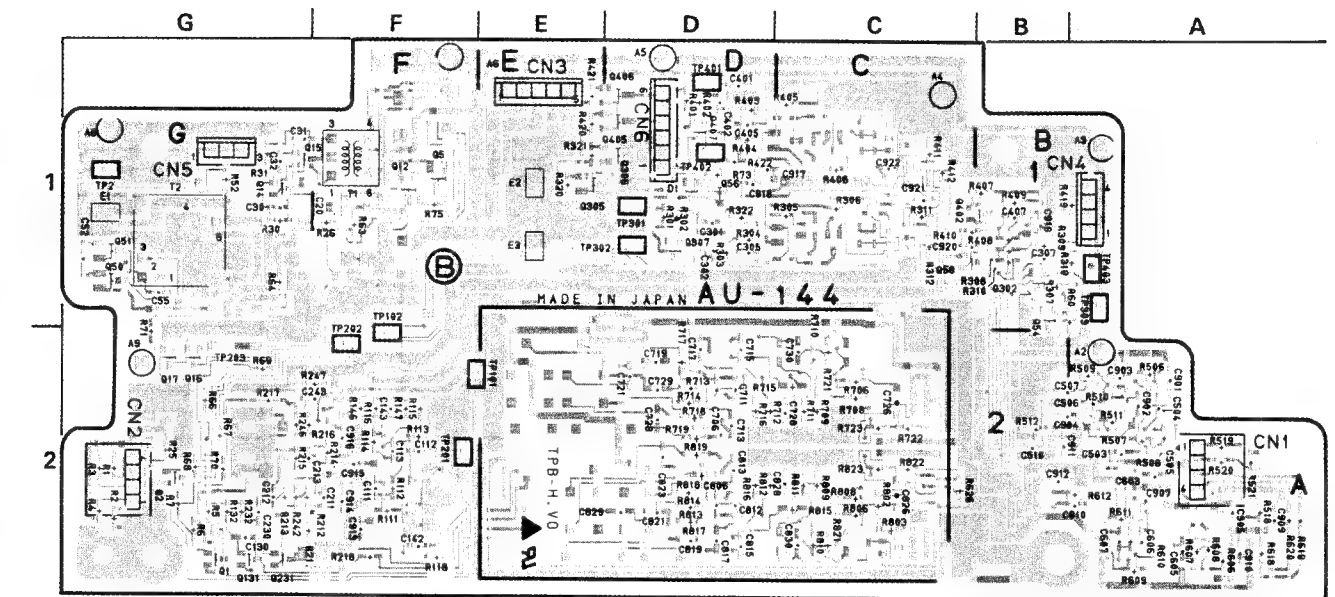
S/N 10001 through 10500

A Side



AU-144/P -A SIDE-  
1-640-271-11  
PVV-1-----AU-144  
PVV-1P-----AU-144P

B Side

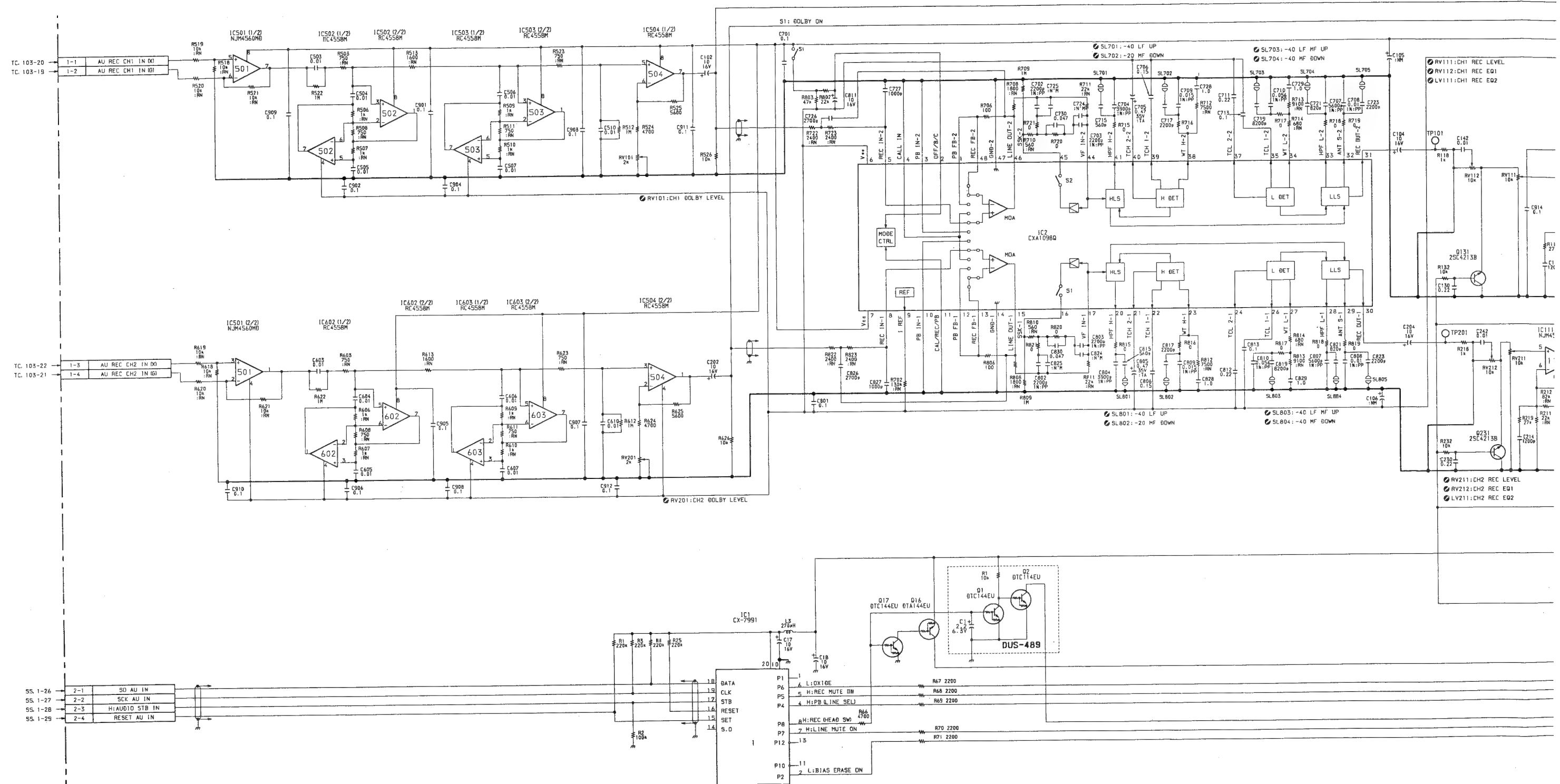


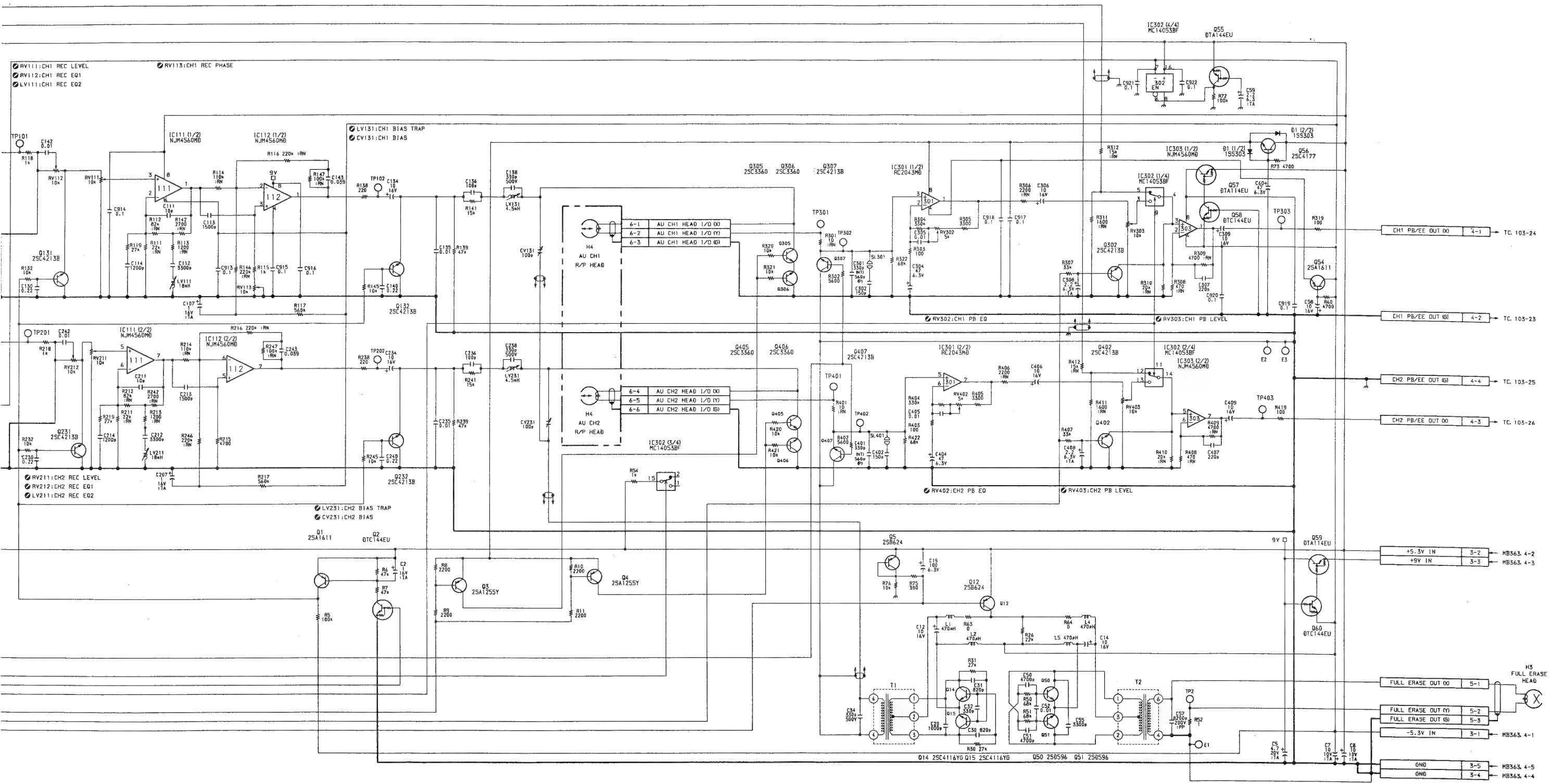
AU-144/P -B SIDE-  
1-640-271-11  
PVV-1-----AU-144  
PVV-1P-----AU-144P

AU-144P BOARD

Audio REC/PB Amplifier  
Bias/Erase Oscillator

S/N 10001 through 10500





AU-144P BOARD  
1-640-271-11  
PVV-1P (EK) : #10001-10500

## DUS-489 BOARD

B Side



## DUS-489

-B SIDE-  
1-641-894-11  
PVV-1P

## AU-144P (1-640-271-12)

CN1	A-2	Q402	C-1 (B)
CN2	G-2	Q405	D-1 (B)
CN3	E-1	Q406	D-1 (B)
CN4	B-1	Q407	D-1 (B)
CN5	G-1		
CN6	D-1	RV101	B-2
CN7	D-1	RV111	F-2
CN8	D-1	RV112	F-2
		RV113	F-2
CV131	F-1	RV201	B-2
CV231	F-1	RV211	F-2
		RV212	G-2
D1	C-1 (B)	RV302	C-1
		RV303	C-1
E1	G-1	RV402	C-1
E2	E-1	RV403	C-1
E3	E-1		
IC1	G-2	S1	B-2
IC2	C-2	TP2	G-1
IC111	F-2	TP101	E-2
IC112	F-2	TP102	F-2
IC301	D-1	TP201	F-2
IC302	C-1	TP202	F-2
IC303	B-1	TP301	D-1
IC501	A-2	TP302	D-1
IC502	A-2	TP303	A-2
IC503	B-2	TP401	D-1
IC504	A-2	TP402	D-1
IC602	A-2	TP403	A-1
IC603	A-2		
LV111	F-2	T1	F-1
LV131	F-1	T2	G-1
LV211	G-2		
LV231	F-1		
Q1	G-2 (B)		
Q2	G-2 (B)		
Q3	E-1		
Q4	D-1		
Q5	F-1 (B)		
Q6	G-2 (B)		
Q7	G-2 (B)		
Q12	F-1 (B)		
Q14	G-1 (B)		
Q15	F-1 (B)		
Q16	G-2 (B)		
Q17	G-2 (B)		
Q50	G-1 (B)		
Q51	G-1 (B)		
Q54	B-2 (B)		
Q55	C-1		
Q56	C-1 (B)		
Q57	B-1		
Q58	C-1 (B)		
Q59	E-1		
Q60	F-1		
Q131	G-2 (B)		
Q132	F-1		
Q231	G-2 (B)		
Q232	F-2		
Q302	B-1 (B)		
Q305	D-1 (B)		
Q306	D-1 (B)		
Q307	D-1 (B)		

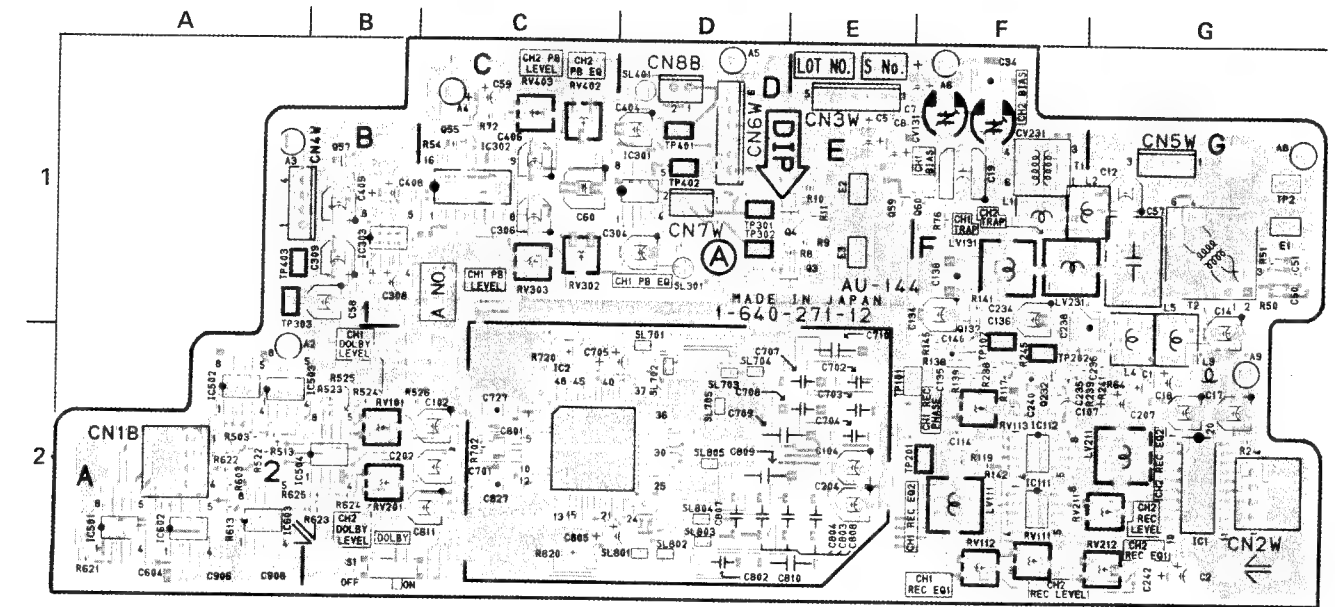
NOTE  
\*.. : \*..A SIDE  
\*..(B); \*..B SIDE

## AU-144P BOARD

Audio REC/PB

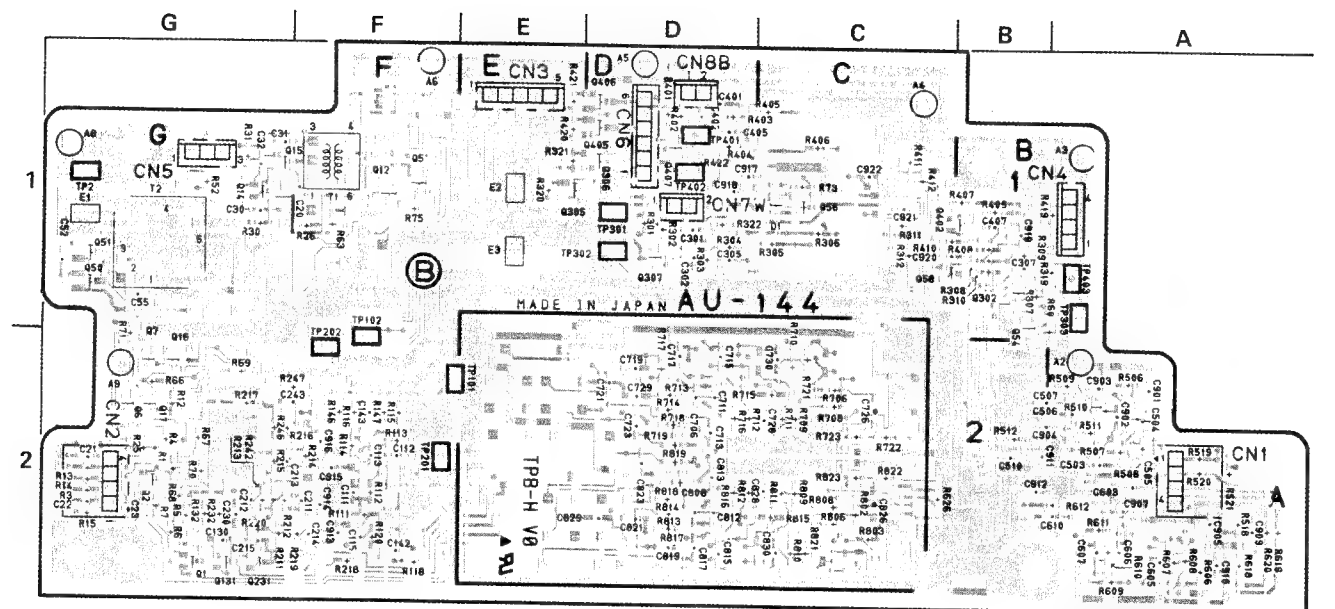
S/N 10501 through 11420

A Side



AU-144P -A SIDE-  
1-640-271-12  
PVV-1P

B Side

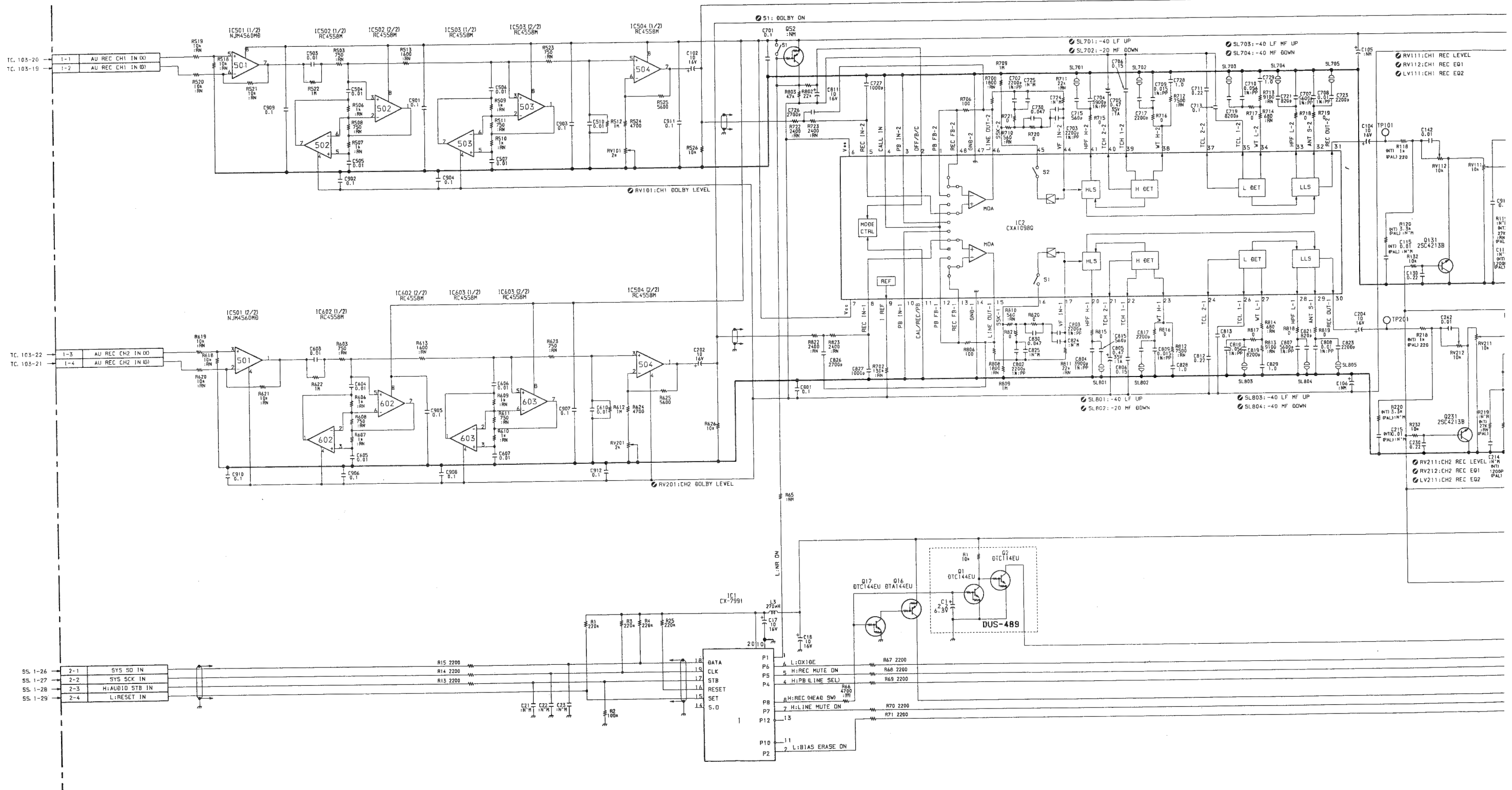


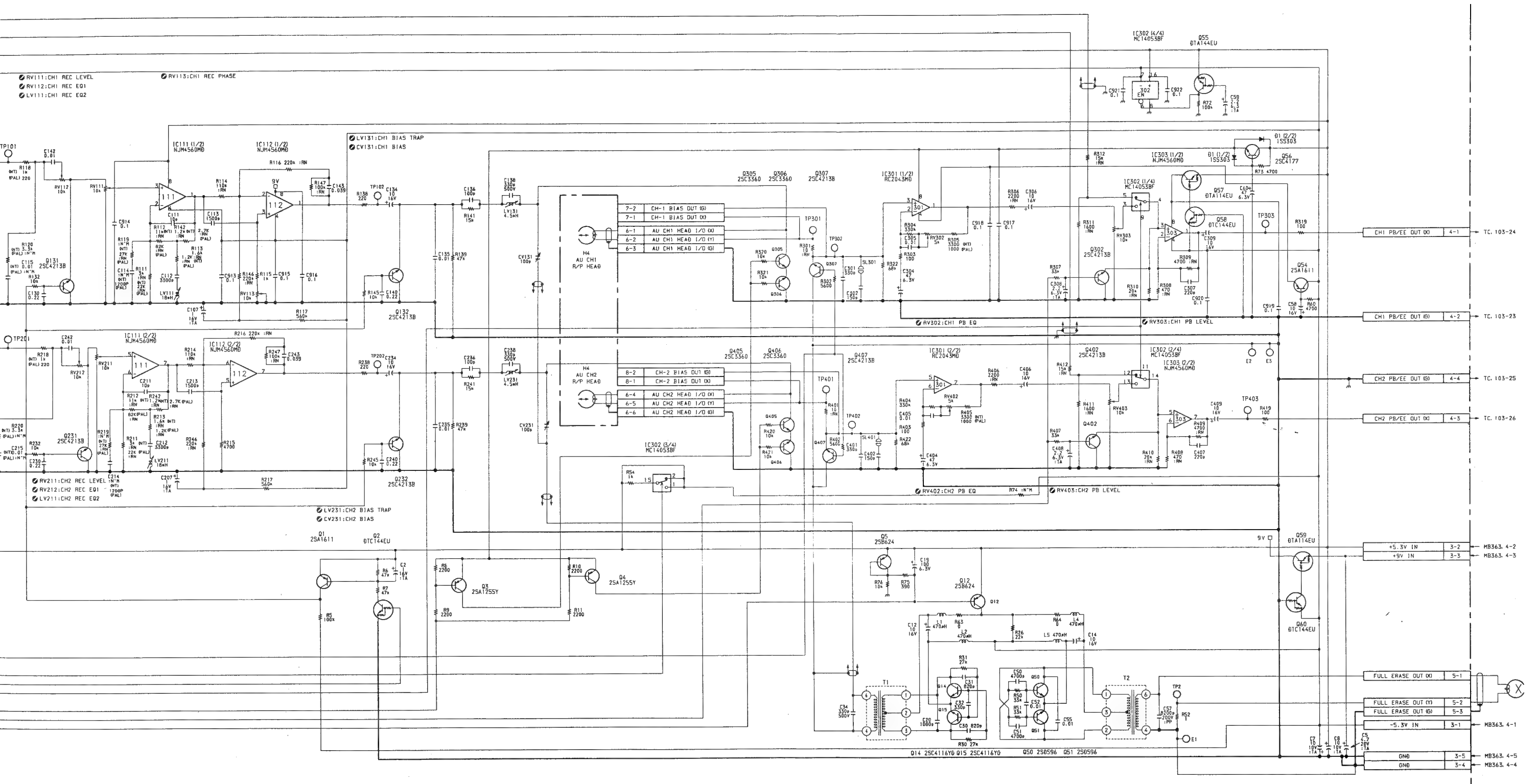
AU-144P -B SIDE-  
1-640-271-12  
PVV-1P

AU-144P BOARD

Audio REC/PB Amplifier  
Bias/Erase Oscillator

S/N 10501 through 11420





AU-144P BOARD  
1-640-271-12  
PVV-1P (EK) ; #10501-11420



AU-144P BOARD

Audio REC/PB

S/N 11421 through 11740

A Side

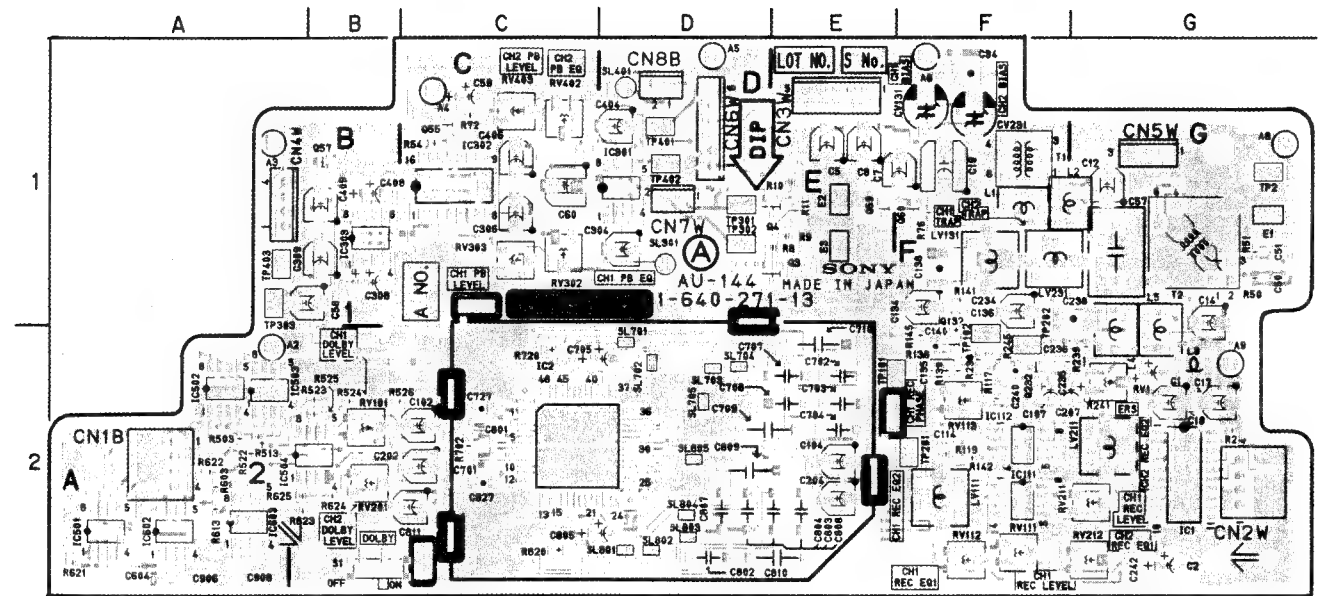
AU-144P (1-640-271-13)

CN1	A-2	RV1	G-2
CN2	G-2	RV101	B-2
CN3	E-1	RV111	F-2
CN4	B-1	RV112	F-2
CN5	G-1	RV113	F-2
CN6	D-1	RV201	B-2
		RV211	F-2
CV131	F-1	RV212	G-2
CV231	F-1	RV302	C-1
		RV303	C-1
D1	C-1 (B)	RV402	C-1
		RV403	C-1
E1	G-1		
E2	E-1	S1	B-2
E3	E-1		
IC1	G-2	TP2	G-1
IC2	C-2	TP101	E-2
IC111	F-2	TP102	F-2
IC112	F-2	TP201	F-2
IC301	D-1	TP202	F-2
IC302	C-1	TP301	D-1
IC303	B-1	TP302	D-1
IC501	A-2	TP303	A-2
IC502	A-2	TP401	D-1
IC503	B-2	TP402	D-1
IC504	A-2	TP403	A-1
IC602	A-2		
IC603	A-2	T1	F-1
		T2	G-1

LV111	F-2
LV131	F-1
LV211	G-2
LV231	F-1

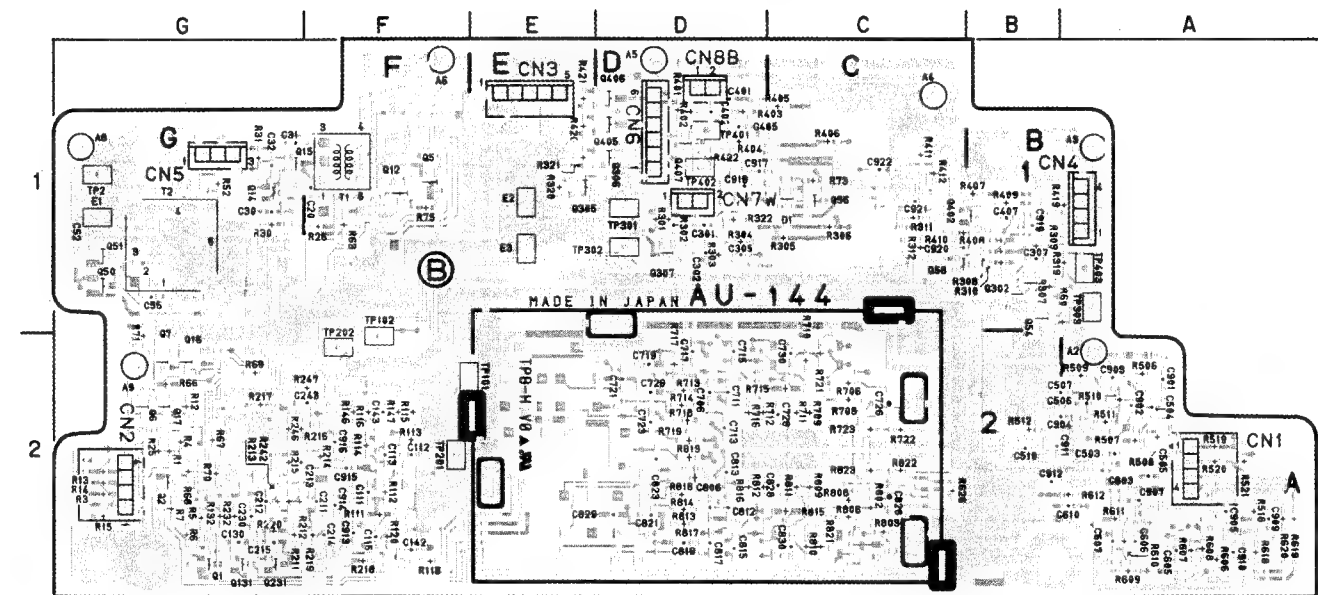
Q1	G-2 (B)
Q2	G-1 (B)
Q3	E-1
Q4	D-1
Q5	F-1 (B)
Q12	F-1 (B)
Q14	G-1 (B)
Q15	F-1 (B)
Q16	G-2 (B)
Q17	G-2 (B)
Q50	G-1 (B)
Q51	G-1 (B)
Q54	B-2 (B)
Q55	C-1
Q56	C-1 (B)
Q57	B-1
Q58	C-1 (B)
Q59	E-1
Q60	F-1
Q131	G-2 (B)
Q132	F-1
Q231	G-2 (B)
Q232	F-2
Q302	B-1 (B)
Q305	D-1 (B)
Q306	D-1 (B)
Q307	D-1 (B)
Q402	C-1 (B)
Q405	D-1 (B)
Q406	D-1 (B)
Q407	D-1 (B)

NOTE  
 \*\* : \*\* A SIDE  
 \*\* (B) : \*\* B SIDE



**AU-144P -A SIDE-**  
 1-640-271-13  
 PVV-1P

B Side



**AU-144P -B SIDE-**  
 1-640-271-13  
 PVV-1P

AU-144P BOARD

Audio REC/PB

S/N 11741 and higher

A Side

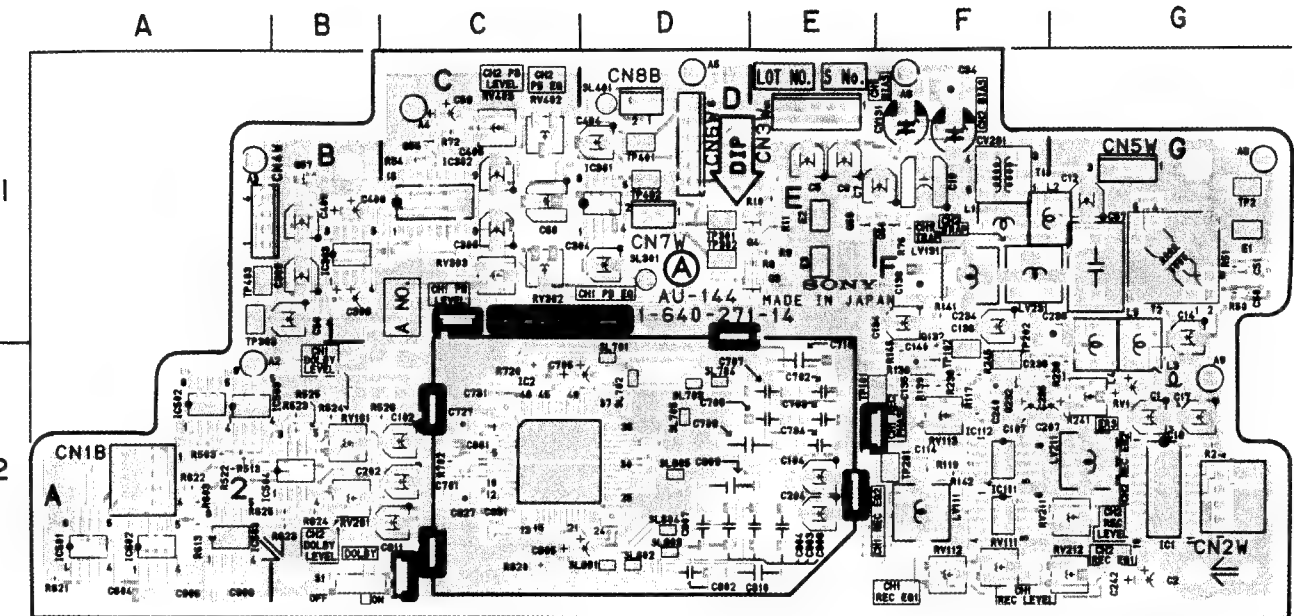
AU-144P (1-640-271-14)

CN1	A-2	RV101	B-2
CN2	G-2	RV111	F-2
CN3	E-1	RV112	F-2
CN4	B-1	RV113	F-2
CN5	G-1	RV201	B-2
CN6	D-1	RV211	F-2
		RV212	G-2
CV131	F-1	RV302	C-1
CV231	F-1	RV303	C-1
		RV402	C-1
		RV403	C-1
D1	C-1 (B)		
E1	G-1	S1	B-2
E2	E-1		
E3	E-1	TP2	G-1
		TP101	E-2
		TP102	F-2
IC1	G-2	TP201	F-2
IC2	C-2	TP202	F-2
IC111	F-2	TP301	D-1
IC112	F-2	TP302	D-1
IC301	D-1	TP303	A-2
IC302	C-1	TP401	D-1
IC303	B-1	TP402	D-1
IC501	A-2	TP403	A-1
IC502	A-2		
IC503	B-2		
IC504	A-2	T1	F-1
IC602	A-2	T2	G-1
IC603	A-2		

LV111	F-2
LV131	F-1
LV211	G-2
LV231	F-1

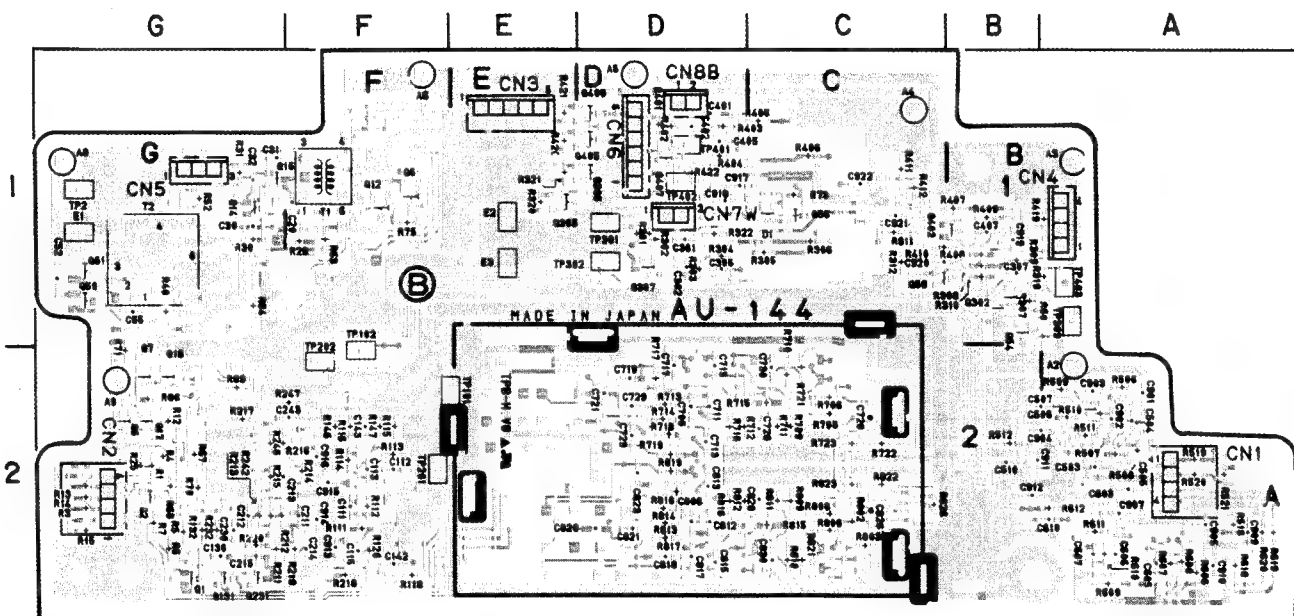
Q1	G-2 (B)
Q2	G-1 (B)
Q3	E-1
Q4	D-1
Q5	F-1 (B)
Q12	F-1 (B)
Q14	G-1 (B)
Q15	F-1 (B)
Q16	G-2 (B)
Q17	G-2 (B)
Q50	G-1 (B)
Q51	G-1 (B)
Q54	B-2 (B)
Q55	C-1
Q56	C-1 (B)
Q57	B-1
Q58	C-1 (B)
Q59	E-1
Q60	F-1
Q131	G-2 (B)
Q132	F-1
Q231	G-2 (B)
Q232	F-2
Q302	B-1 (B)
Q305	D-1 (B)
Q306	D-1 (B)
Q307	D-1 (B)
Q402	C-1 (B)
Q405	D-1 (B)
Q406	D-1 (B)
Q407	D-1 (B)

NOTE  
 \* : A SIDE  
 \* (B) : B SIDE



**AU-144P -A SIDE-**  
 1-640-271-14  
 PVV-1P

B Side



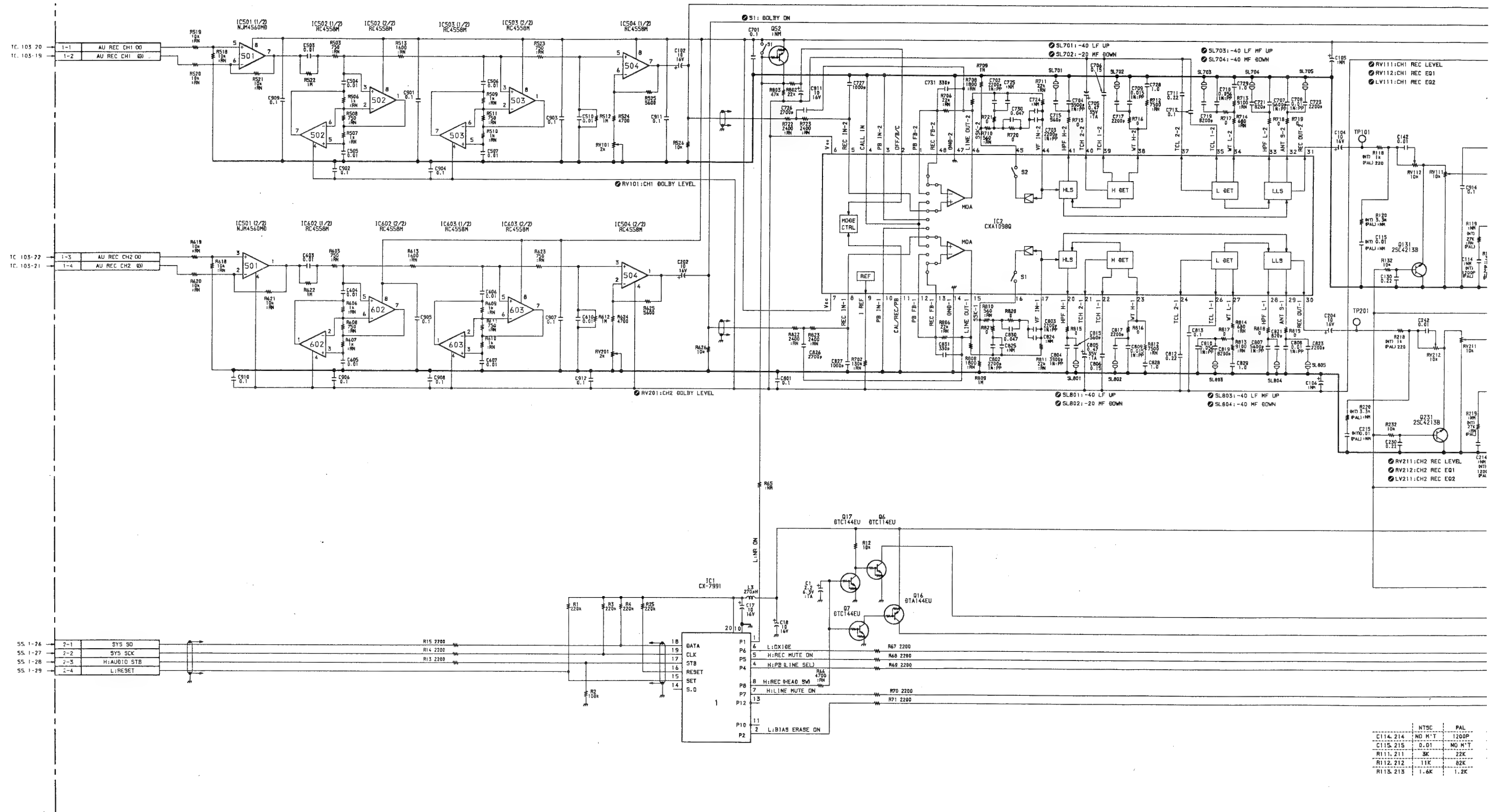
**AU-144P -B SIDE-**  
 1-640-271-14  
 PVV-1P

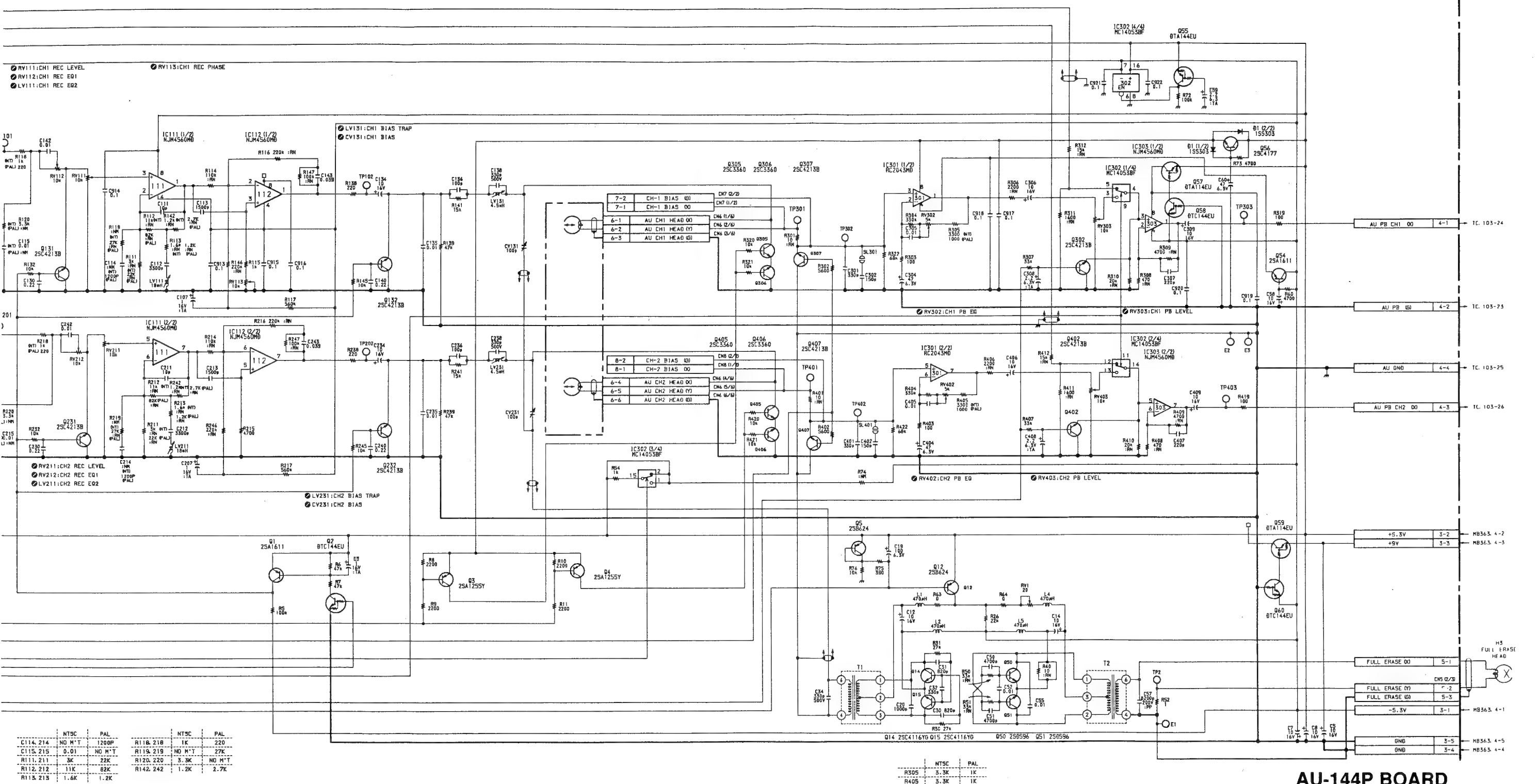


AU-144P BOARD

Audio REC/PB Amplifier  
Bias/Erase Oscillator

S/N 11421 and higher





# AU-144P BOARD

1-640-271-13, 14  
PVV-1P (EK) ; #11421-

## TC-60P BOARD

Audio Line/Meter Amp  
Time Code

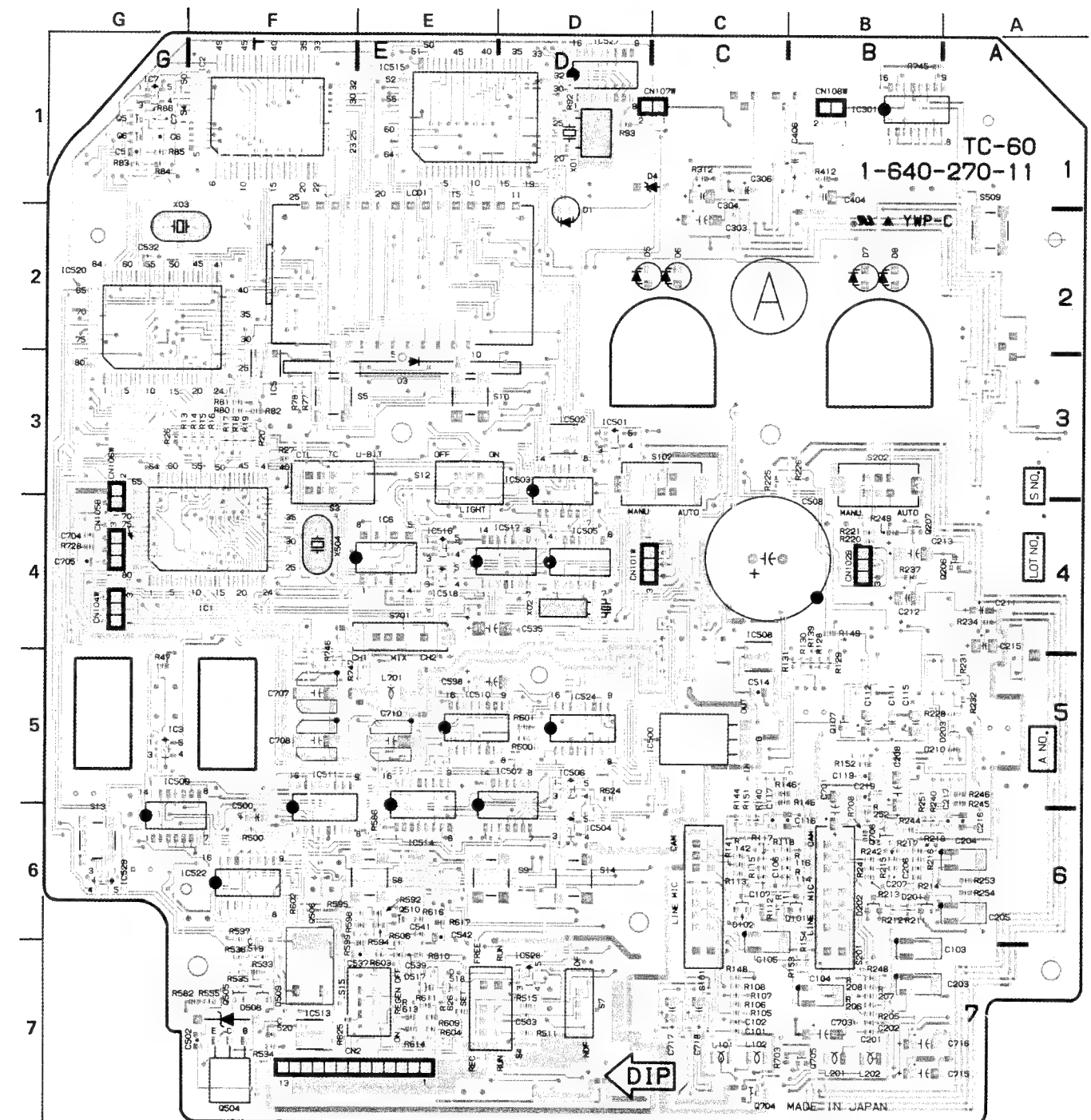
S/N 10001 through 10100

## TC-60/P (1-640-270-11)

CN1	C-7 (B)	IC202	A-6 (B)	Q506	F-6
CN2	E-7 (B)	IC205	A-5 (B)	Q507	F-7 (B)
CN101	C-4 (B)	IC301	B-1	Q508	D-4 (B)
CN102	B-4 (B)	IC303	A-3 (B)	Q510	E-6
CN103	B-7 (B)	IC304	C-2 (B)	Q511	D-5 (B)
CN104	G-4 (B)	IC500	C-5	Q512	C-5 (B)
CN105	G-4 (B)	IC501	D-3	Q702	F-5 (B)
CN106	G-3 (B)	IC502	D-3	Q703	B-7 (B)
CN107	C-1 (B)	IC503	D-3	Q704	C-7
CN108	B-1 (B)	IC504	D-6	Q705	B-7
		IC505	D-4	Q706	B-6
		IC506	D-5		
D1	D-2	IC507	D-5	RV1	F-7 (B)
D2	E-5 (B)	IC508	C-4	RV302	C-1 (B)
D3	E-3	IC509	G-6	RV402	B-1 (B)
D4	C-1	IC510	E-5	RV700	F-3 (B)
D5	D-2	IC511	F-5	RV701	E-5 (B)
D6	C-2	IC512	F-7 (B)	RV704	A-2 (B)
D7	B-2	IC513	F-7		
D8	B-2	IC514	E-6	S3	F-4
D101	B-6	IC515	E-1	S4	D-7
D102	C-6	IC516	E-4	S5	E-3
D103	B-4 (B)	IC517	D-4	S7	D-7
D201	B-6	IC518	E-4	S8	E-6
D202	B-6	IC519	E-2 (B)	S9	D-6
D203	A-5	IC520	G-2	S10	D-3
D301	C-2 (B)	IC521	E-5 (B)	S12	E-3
D501	D-3 (B)	IC522	F-6	S13	G-6
D502	C-5 (B)	IC523	E-7 (B)	S14	D-6
D503	C-5 (B)	IC524	D-5	S15	E-7
D504	C-5 (B)	IC525	E-7 (B)	S16	G-6 (B)
D505	C-5 (B)	IC526	D-5 (B)	S17	G-6 (B)
D506	F-5 (B)	IC527	D-1	S101	C-7
D507	D-4 (B)	IC528	D-7	S102	C-3
D508	F-7	IC529	G-6	S103	B-5 (B)
D509	F-7	IC702	F-5 (B)	S201	B-7
D510	F-6 (B)	IC703	E-5 (B)	S202	B-3
D511	F-6 (B)			S203	A-5 (B)
D512	F-7 (B)			S509	A-2
D513	D-4 (B)	LCD1	E-2	S701	E-4
D514	D-4 (B)				
D515	D-4 (B)	Q2	D-5 (B)	TP1	C-5 (B)
D516	D-5 (B)	Q3	D-2 (B)	TP2	C-4 (B)
D517	E-7	Q4	C-2 (B)	TP3	F-6 (B)
D518	E-7	Q5	G-1	TP4	D-4 (B)
D701	B-7 (B)	Q6	G-1	TP5	F-6 (B)
D702	B-5 (B)	Q101	B-7 (B)	TP6	F-6 (B)
D704	C-7 (B)	Q102	C-3 (B)	TP7	C-4 (B)
		Q103	B-4 (B)	TP8	G-5 (B)
		Q104	B-4 (B)	TP9	F-3 (B)
		Q105	B-5 (B)	TP10	G-5 (B)
		Q106	B-4 (B)	TP11	G-5 (B)
		Q107	B-5	TP12	D-7 (B)
		Q201	A-7 (B)	TP201	B-4 (B)
		Q202	B-4 (B)	TP301	A-3 (B)
		Q203	A-5 (B)	TP401	A-3 (B)
		Q204	A-5 (B)		
		Q205	A-4 (B)		
		Q206	A-4		
		Q207	B-4	X1	D-1
		Q301	C-2 (B)	X2	D-4
		Q401	B-2 (B)	X3	G-2
		Q501	C-5 (B)	X504	F-4
		Q502	C-4 (B)		
		Q503	C-4 (B)		
		Q504	F-7		
		Q505	F-7		

NOTE  
 \*\* : \*\*A SIDE  
 \*\* (B) : \*\*B SIDE

A Side



B Side

TC-60/P -A SIDE-

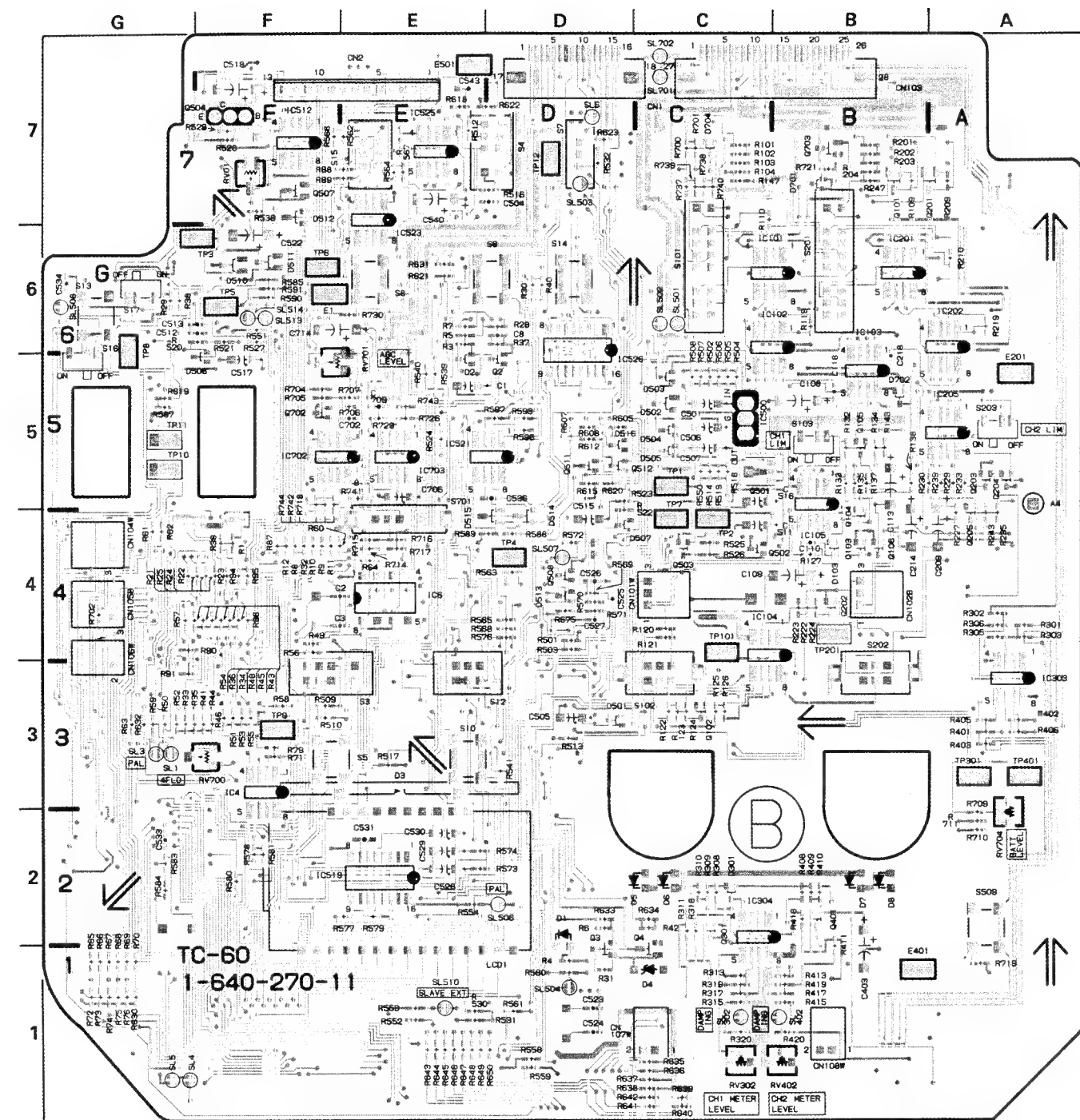
1-640-270-11

PVV-1-----TC-60

PVV-1P-----TC-60P

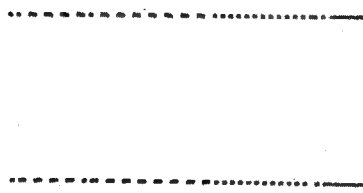
TC-60P (1/3)

B Side

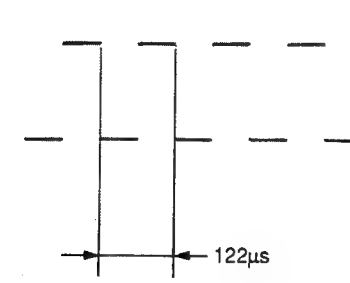


TC-60/P -B SIDE-  
1-640-270-11  
PVV-1-----TC-60  
PVV-1P-----TC-60P

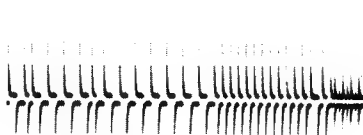
① TP5 PB LTC 5Vp-p PB mode



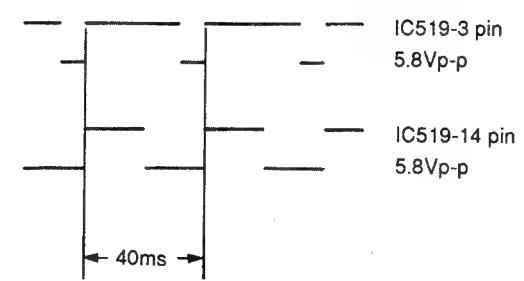
③ IC519-4 pin 6Vp-p REC mode



② CN1-16 pin REC LTC 16Vp-p REC mode



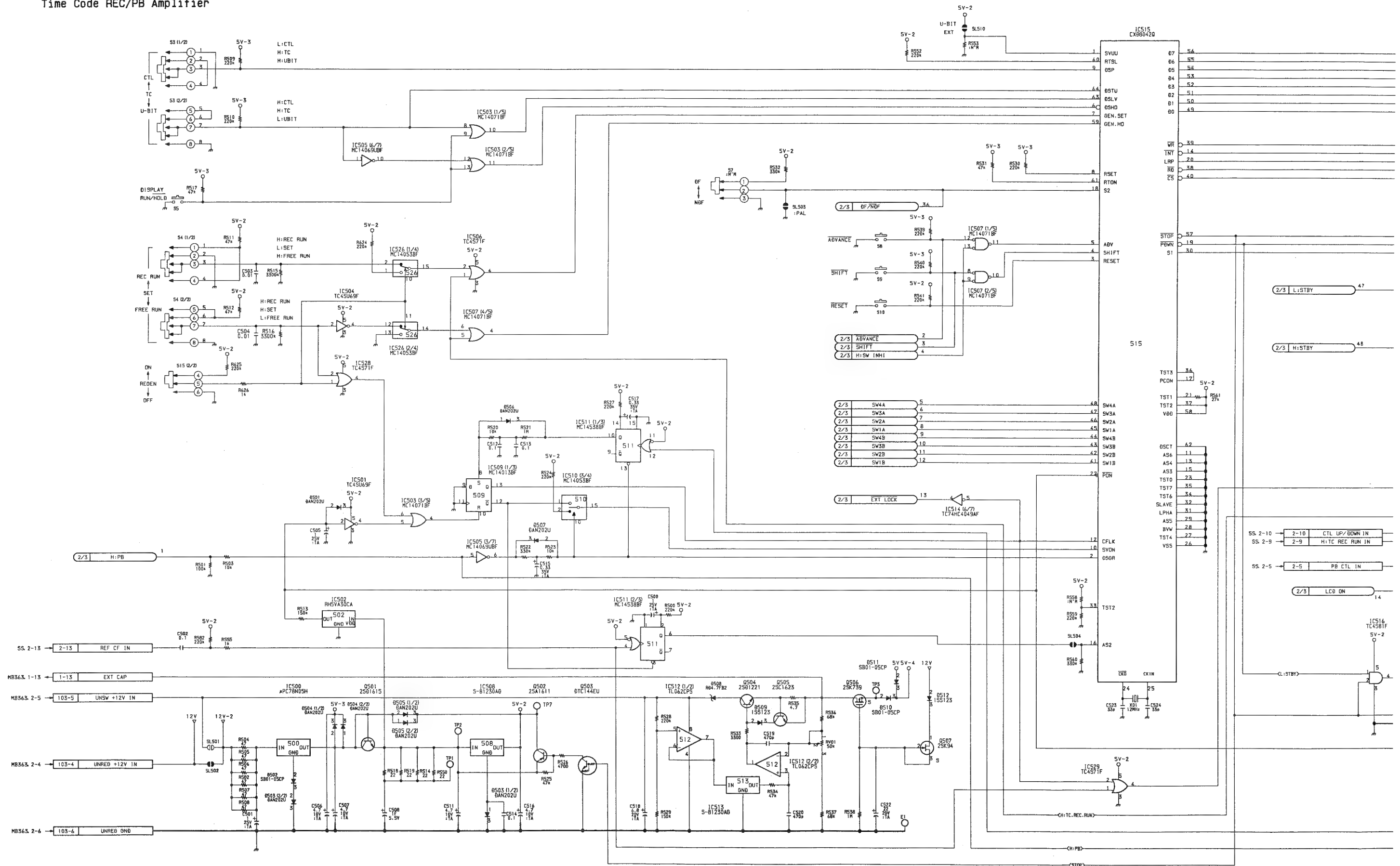
④ REC mode



TC-60P BOARD (1/3)

Time Code SW  
Time Code Generator  
Time Code REC/PB Amplifier

S/N 10001 through 10100



11-15 (a)

11-15 (a)

A

B

C

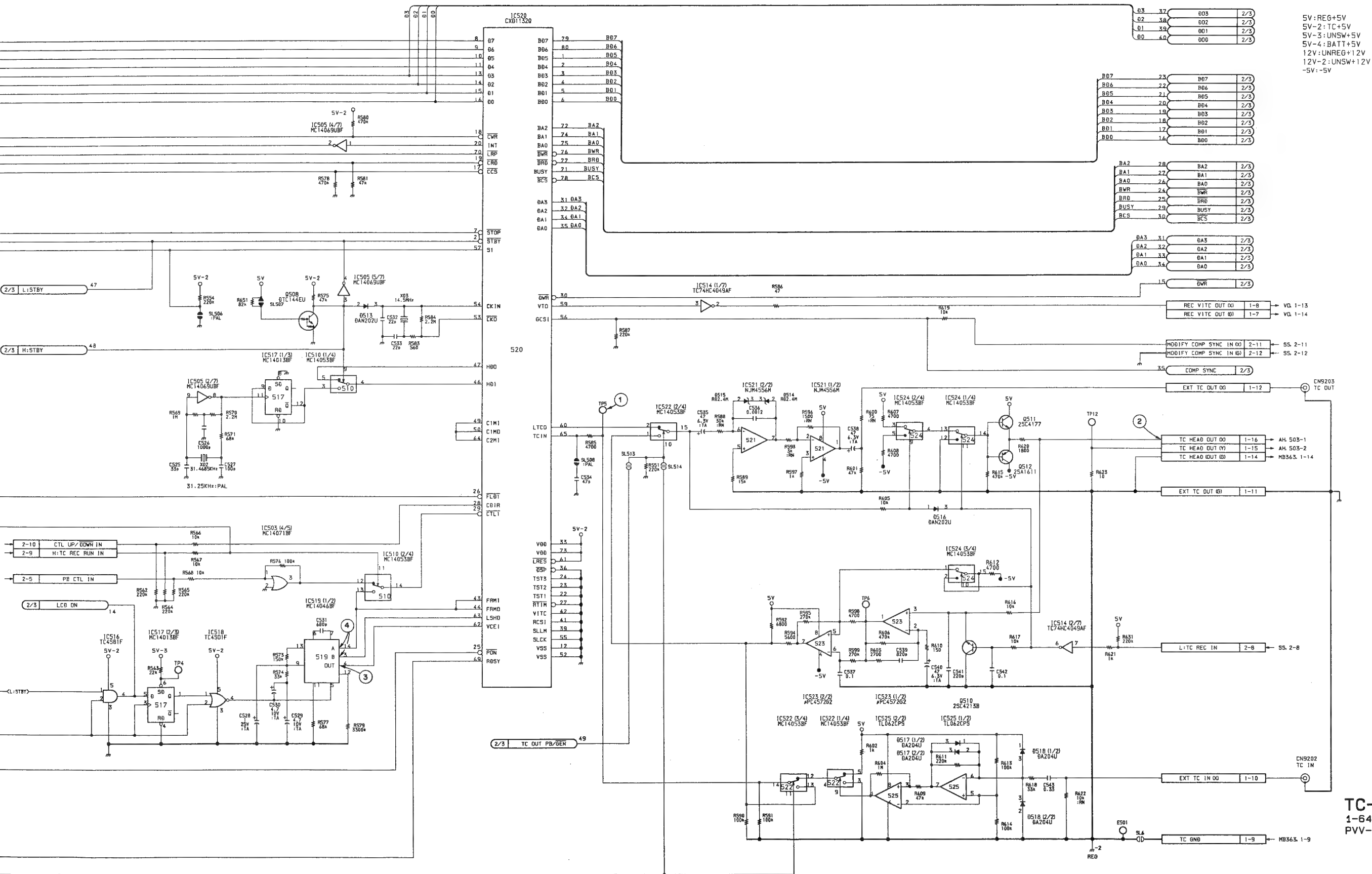
D

E

F

G

H



TC-60P BOARD (1/3)  
 1-640-270-11  
 PVV-1P (EK); #10001-10100



## TC-60P BOARD

Audio Line/Meter Amp  
Time Code

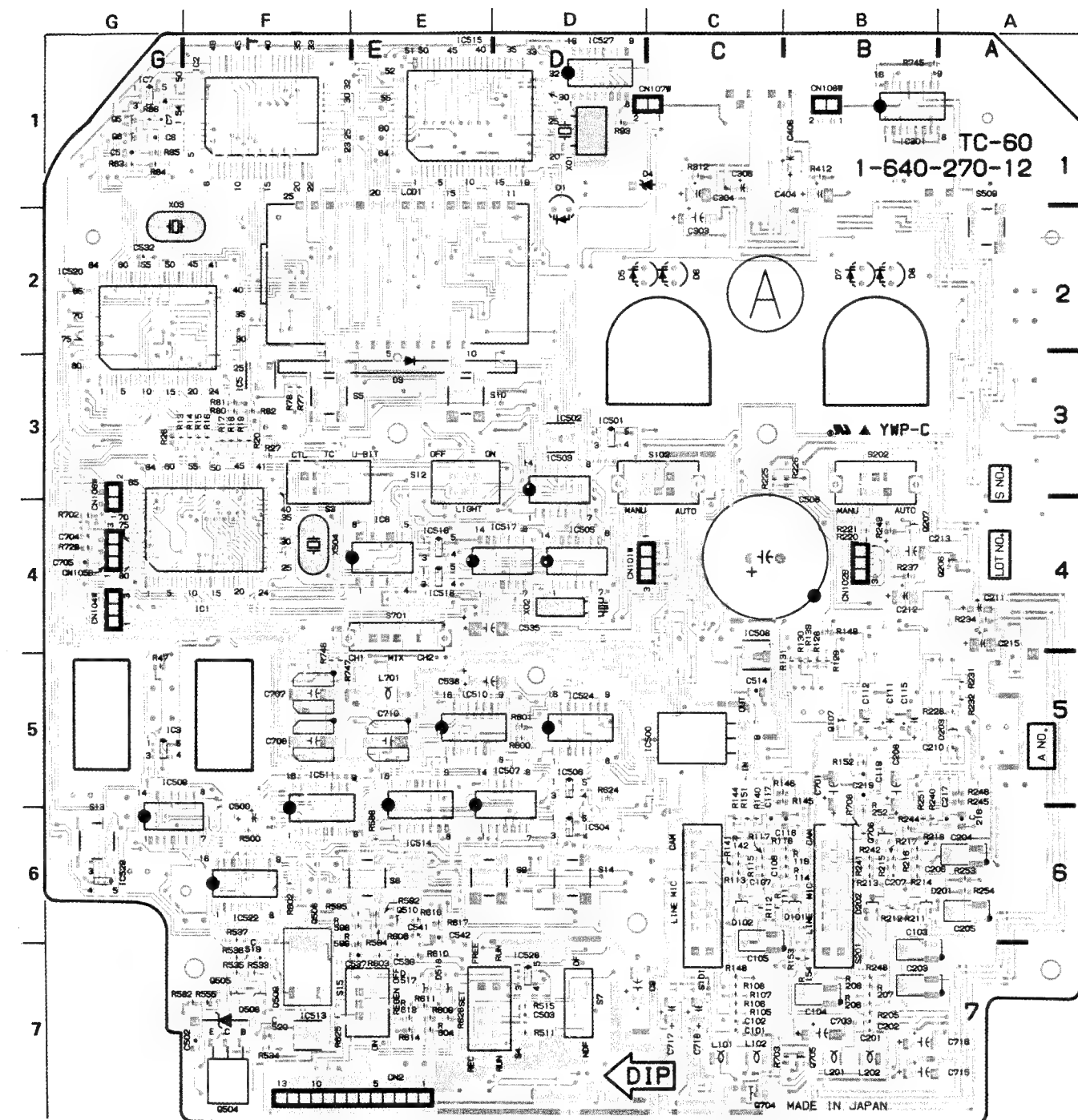
S/N 10101 through 11420

## TC-60P (1-640-270-12)

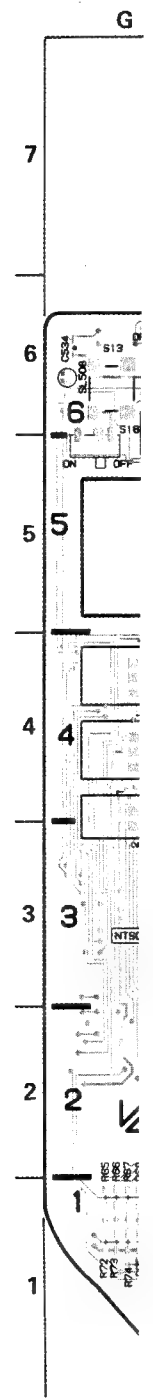
CN1	D-7 (B)	IC202	A-6 (B)	Q506	F-7
CN2	E-7 (B)	IC205	A-5 (B)	Q507	F-7 (B)
CN101	C-4 (B)	IC301	B-1	Q508	D-4 (B)
CN102	B-4 (B)	IC303	A-3 (B)	Q510	E-6
CN103	B-7 (B)	IC304	B-2 (B)	Q511	D-5 (B)
CN104	G-4 (B)	IC500	C-5	Q512	C-5 (B)
CN105	G-4 (B)	IC501	C-3	Q702	E-5 (B)
CN106	G-3 (B)	IC502	D-3	Q703	B-7 (B)
CN107	C-1 (B)	IC503	D-4	Q704	C-7
CN108	B-1 (B)	IC504	D-6	Q705	B-7
		IC505	D-4	Q706	B-6
		IC506	D-5		
D1	D-1	IC507	D-6	RV1	F-7 (B)
D2	D-5 (B)	IC508	C-5	RV302	C-1
D3	E-3	IC509	G-6	RV402	B-1
D4	C-1	IC510	E-5	RV700	F-3 (B)
D5	C-2	IC511	F-6	RV701	E-5 (B)
D6	C-2	IC512	F-7 (B)	RV704	A-1
D7	B-2	IC513	F-7		
D8	B-2	IC514	E-6	S3	E-3
D101	B-6	IC515	D-1	S4	D-7
D102	C-6	IC516	E-4	S5	E-3
D103	B-4 (B)	IC517	D-4	S7	D-7
D201	A-6	IC518	E-4	S8	E-6
D202	B-6	IC519	E-2 (B)	S9	D-6
D203	A-5	IC520	G-2	S10	D-3
D301	C-2 (B)	IC521	D-5 (B)	S12	D-3
D501	C-3 (B)	IC522	F-6	S13	G-6
D502	C-5 (B)	IC523	E-7 (B)	S14	D-6
D503	C-5 (B)	IC524	D-5	S15	E-7
D504	C-5 (B)	IC525	E-7 (B)	S16	G-5 (B)
D505	C-5 (B)	IC526	D-6 (B)	S17	G-6 (B)
D506	F-5 (B)	IC527	D-1	S101	C-6
D507	C-4 (B)	IC528	D-7	S102	C-3
D508	F-7	IC529	G-6	S103	B-5 (B)
D509	F-7	IC702	E-5 (B)	S201	B-6
D510	F-6 (B)	IC703	E-5 (B)	S202	B-3
D511	F-6 (B)			S203	A-5 (B)
D512	F-7 (B)			S509	A-2
D513	D-4 (B)	LCD1	E-2	S701	E-4
D514	D-4 (B)				
D515	D-4 (B)	Q2	D-5 (B)	TP1	C-5 (B)
D516	C-5 (B)	Q3	D-1 (B)	TP2	C-4 (B)
D517	E-7	Q4	C-1 (B)	TP3	F-6 (B)
D518	E-7	Q5	G-1	TP4	D-4 (B)
D701	B-7 (B)	Q6	G-1	TP5	F-6 (B)
D702	B-5 (B)	Q101	B-7 (B)	TP6	E-6 (B)
D704	C-7 (B)	Q102	C-3 (B)	TP7	C-4 (B)
		Q103	B-4 (B)	TP8	G-5 (B)
		Q104	B-4 (B)	TP9	F-3 (B)
E1	E-6 (B)	Q105	B-5 (B)	TP10	G-5 (B)
E201	A-5 (B)	Q106	B-4 (B)	TP11	G-5 (B)
E401	A-2 (B)	Q107	B-5	TP12	C-6 (B)
E501	E-7 (B)	Q201	A-7 (B)	TP13	E-1 (B)
		Q202	B-4 (B)	TP14	A-2 (B)
		Q203	A-5 (B)	TP15	E-1 (B)
		Q204	A-5 (B)	TP16	A-2 (B)
		Q205	A-4 (B)	TP101	C-4 (B)
		Q206	A-4	TP201	B-4 (B)
		Q207	B-4	TP301	A-3 (B)
		Q301	C-2 (B)	TP401	A-3 (B)
		Q401	B-2 (B)		
		Q501	B-5 (B)		
		Q502	C-4 (B)		
		Q503	C-4 (B)		
		Q504	F-7		
		Q505	F-7		
				X1	D-1
				X2	D-4
				X3	F-2
				X504	F-4

NOTE  
\*\* : \*\*A SIDE  
\*\* (B) : \*\*B SIDE

A Side

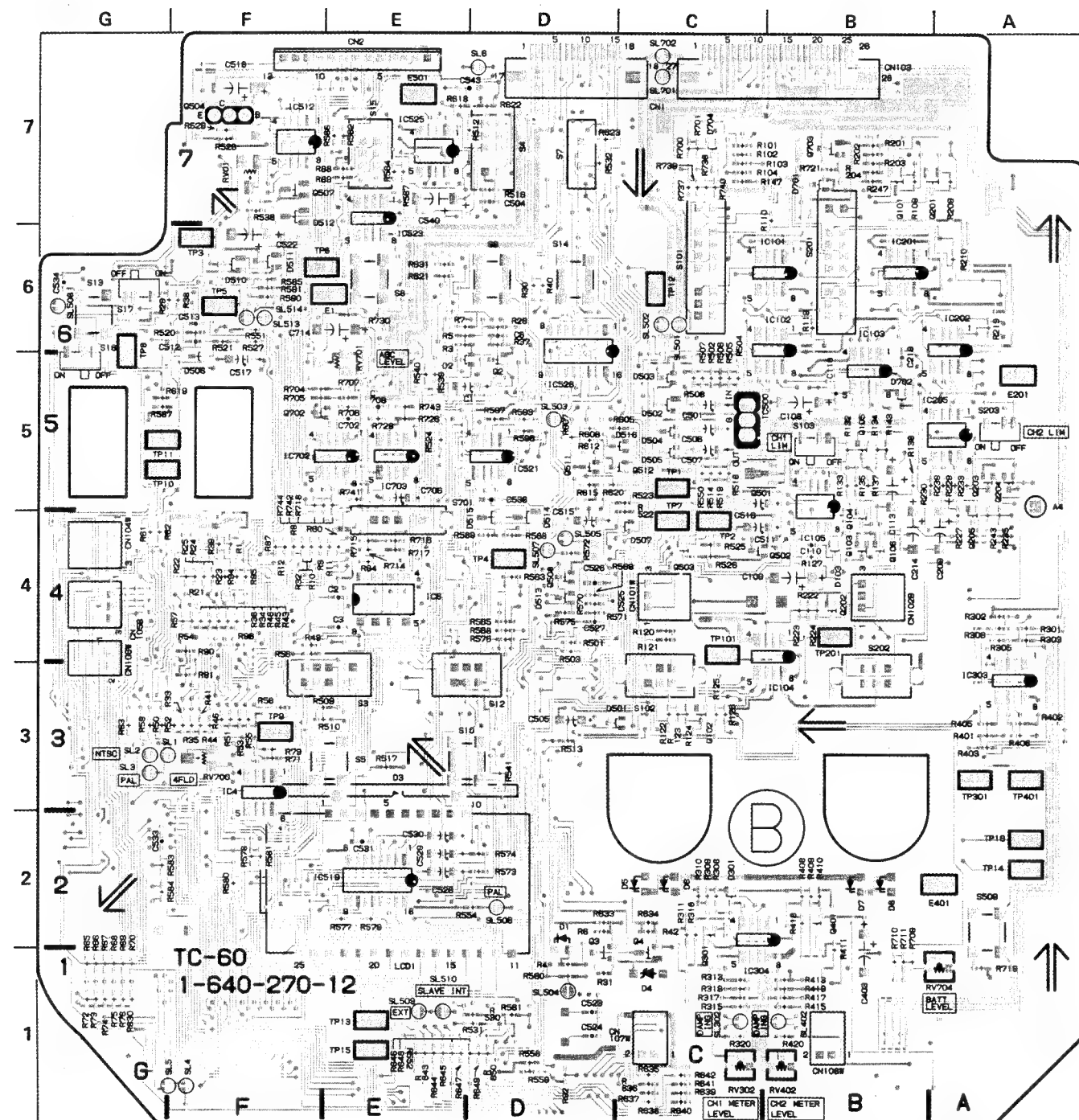


B Side

TC-60P -A SIDE-  
1-640-270-12  
PVV-1P

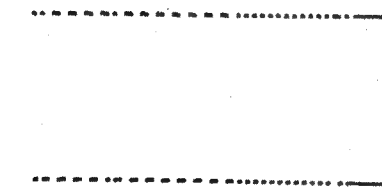
TC-60P (1/3)

B Side

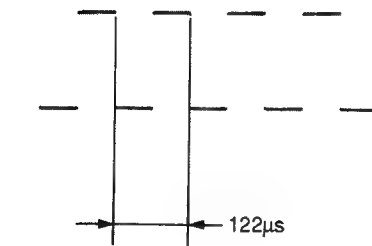


TC-60P -B SIDE-  
1-640-270-12  
PVV-1P

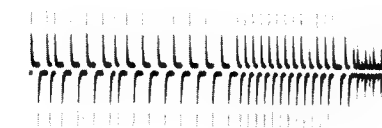
① TP5 PB LTC 5Vp-p PB mode



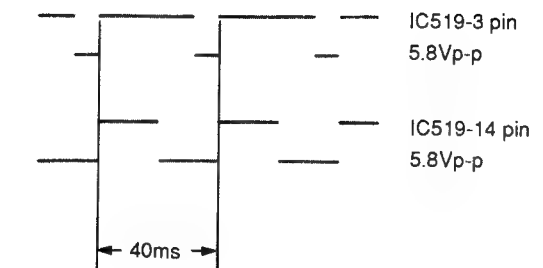
③ IC519-4 pin 6Vp-p REC mode



② CN1-16 pin REC LTC 16Vp-p REC mode



④ REC mode

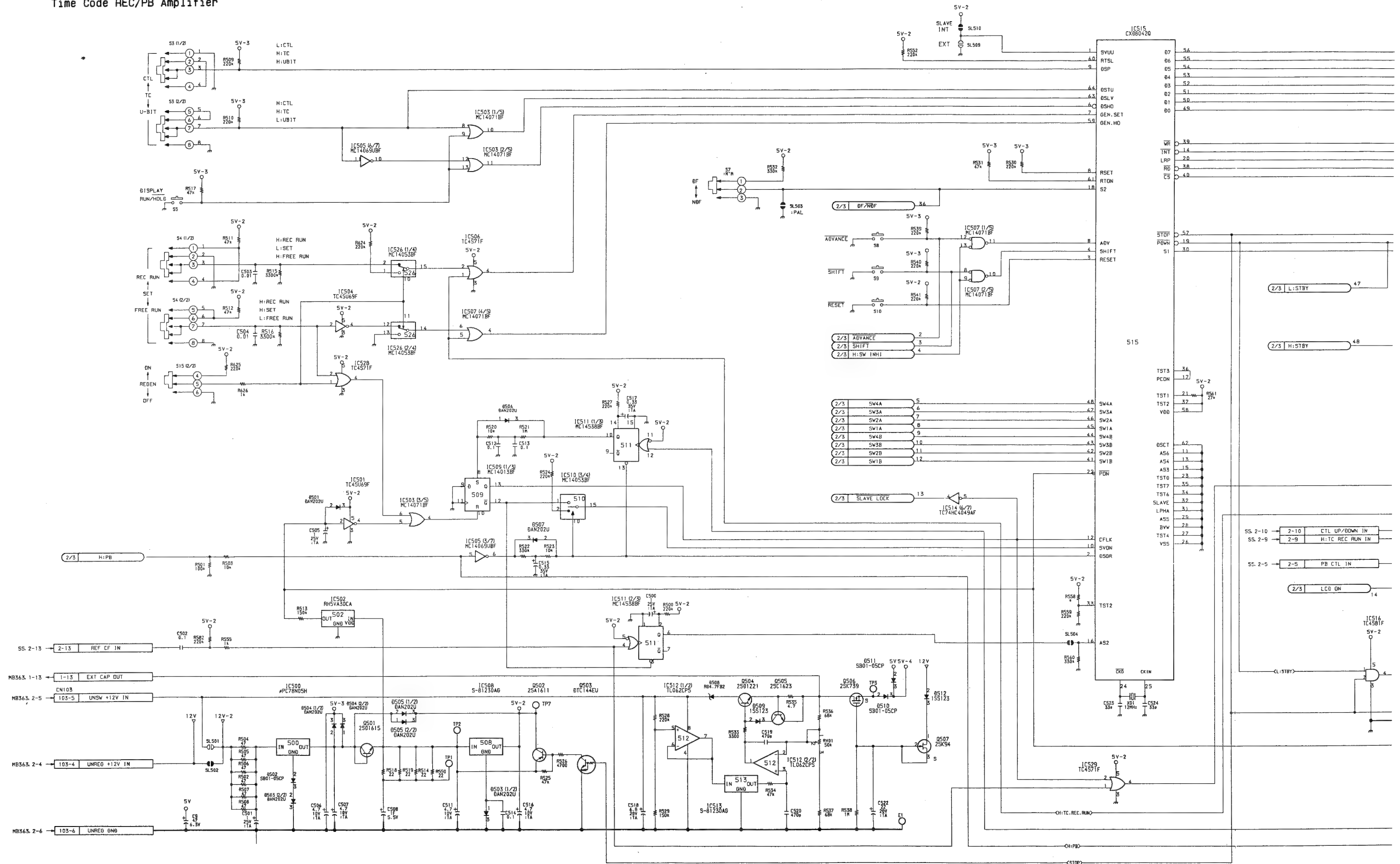




TC-60P BOARD (1/3)

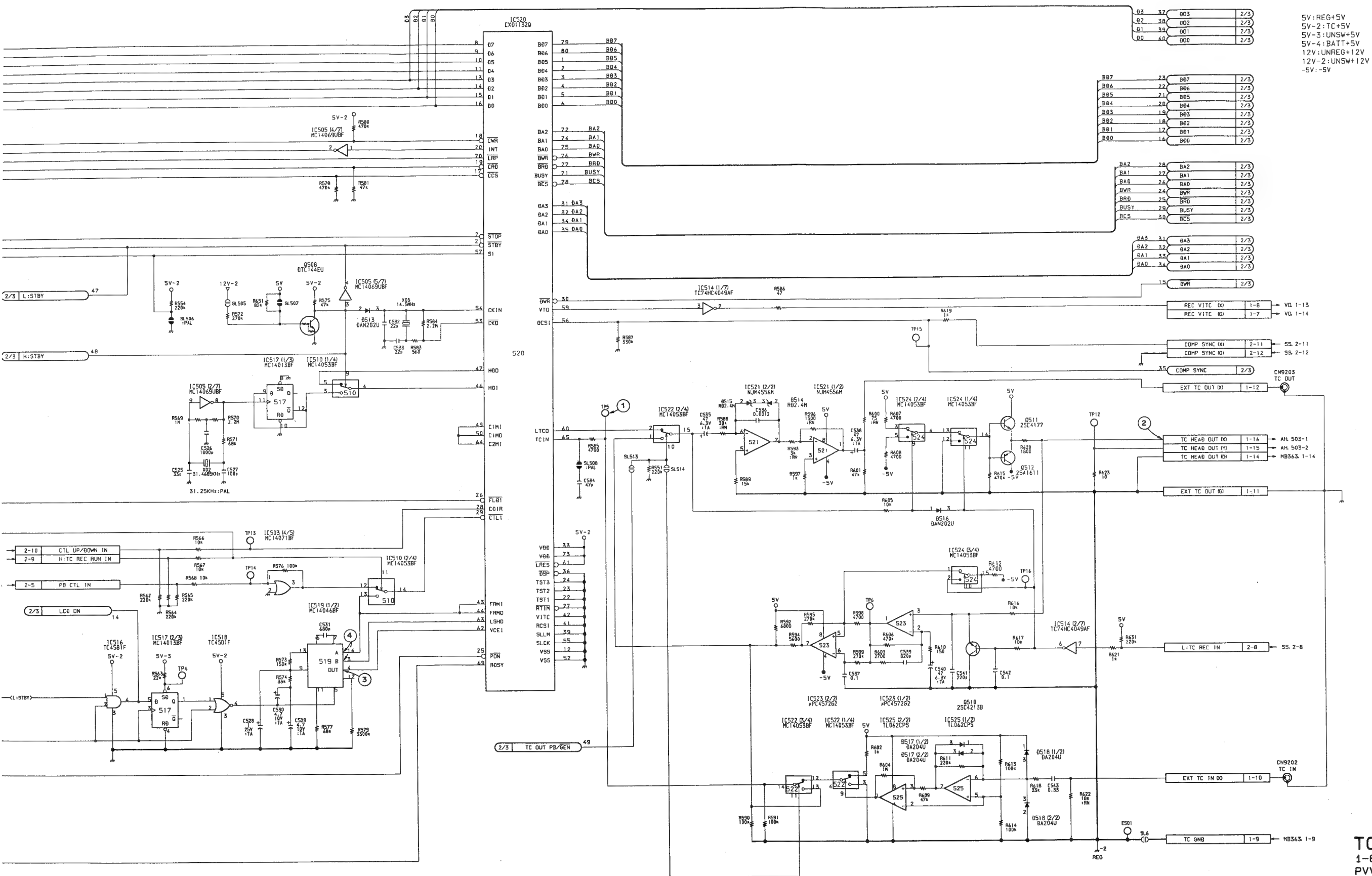
S/N 10101 through 11420

Time Code SW  
Time Code Generator  
Time Code REC/PB Amplifier



11-15 (b)

11-15 (b)



TC-60P BOARD (1/3)  
 1-640-270-12  
 PVV-1P (EK) ; #10101-11420

TC-60P BOARD

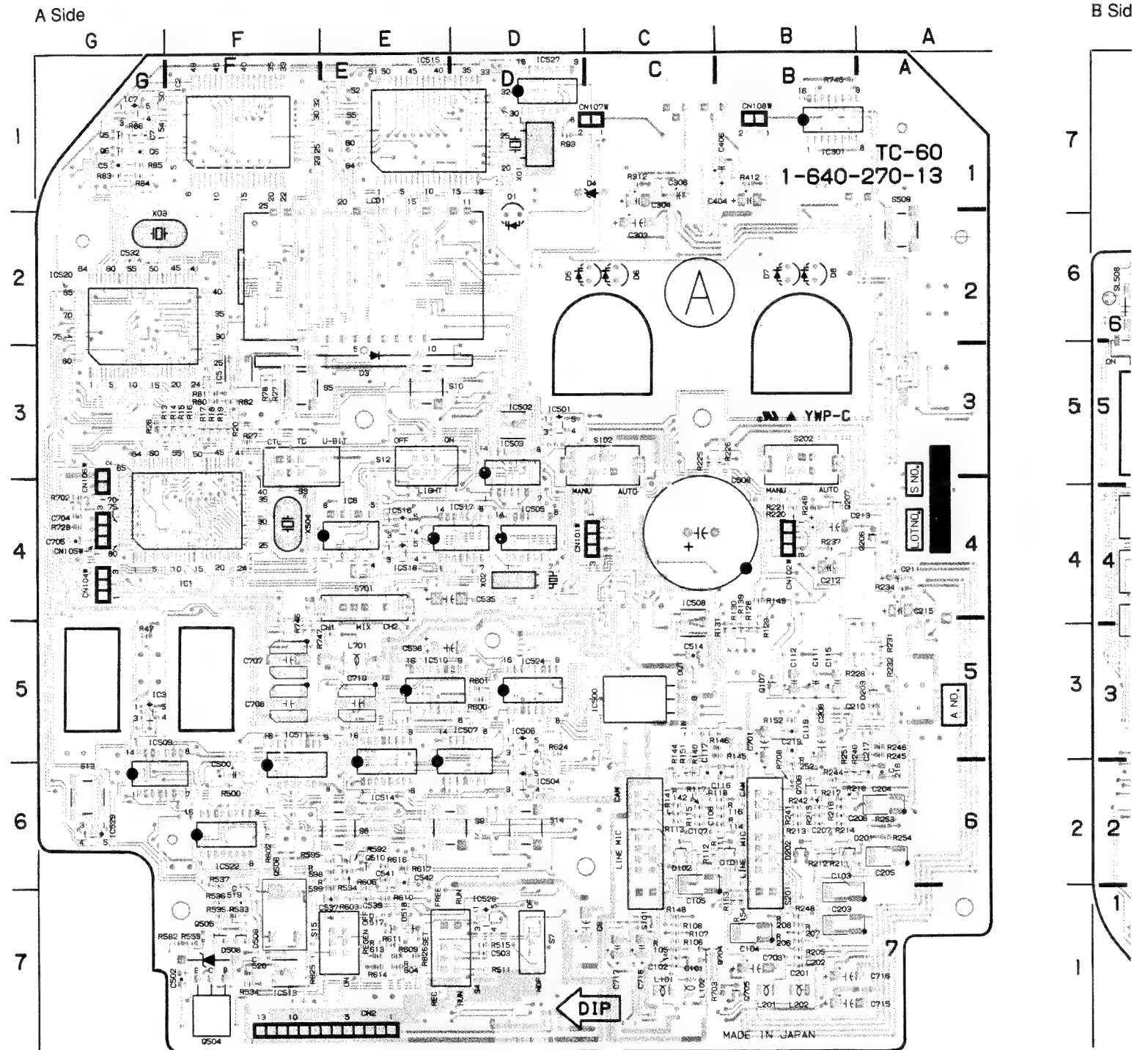
Audio Line/Meter Amp  
Time Code

S/N 11421 and higher

TC-60P (1-640-270-13)

CN1	D-7 (B)	IC202	A-6 (B)	Q506	F-7
CN2	E-7 (B)	IC205	A-5 (B)	Q507	F-7 (B)
CN101	C-4 (B)	IC301	B-1	Q508	D-4 (B)
CN102	B-4 (B)	IC303	A-3 (B)	Q510	E-6
CN103	B-7 (B)	IC304	C-2 (B)	Q511	D-5 (B)
CN104	G-4 (B)	IC500	C-5	Q512	C-5 (B)
CN105	G-4 (B)	IC501	D-3	Q702	F-5 (B)
CN106	G-3 (B)	IC502	D-3	Q703	B-7 (B)
CN107	C-1 (B)	IC503	D-4	Q704	B-7
CN108	B-1 (B)	IC504	D-6	Q705	B-7
		IC505	D-4	Q706	B-6
		IC506	D-5		
D1	D-1	IC507	D-6	RV1	F-7 (B)
D2	E-5 (B)	IC508	C-5	RV302	C-1 (B)
D3	E-3	IC509	G-6	RV402	B-1 (B)
D4	C-1	IC510	E-5	RV700	F-3 (B)
D5	C-2	IC511	F-6	RV701	E-5 (B)
D6	C-2	IC512	F-7 (B)	RV704	A-1 (B)
D7	B-2	IC513	F-7		
D8	B-2	IC514	E-6	S3	F-3
D101	B-6	IC515	E-1	S4	D-7
D102	C-6	IC516	E-4	S5	F-3
D103	B-4 (B)	IC517	D-4	S7	D-7
D201	B-6	IC518	E-4	S8	E-6
D202	B-6	IC519	E-2 (B)	S9	D-6
D203	A-5	IC520	G-2	S10	E-3
D301	C-2 (B)	IC521	D-5 (B)	S12	E-3
D501	D-3 (B)	IC522	F-6	S13	G-6
D502	C-5 (B)	IC523	E-7 (B)	S14	D-6
D503	C-5 (B)	IC524	D-5	S15	E-7
D504	C-5 (B)	IC525	E-7 (B)	S16	G-5 (B)
D505	C-5 (B)	IC526	D-6 (B)	S17	G-6 (B)
D506	F-5 (B)	IC527	D-1	S101	C-6
D507	C-4 (B)	IC528	D-7	S102	C-3
D508	F-7	IC529	G-6	S103	B-5 (B)
D509	F-7	IC702	E-5 (B)	S201	B-6
D510	F-6 (B)	IC703	E-5 (B)	S202	B-3
D511	F-6 (B)			S203	A-5 (B)
D512	F-7 (B)			S509	A-2
D513	D-4 (B)	LCD1	E-2	S701	E-4
D514	D-4 (B)				
D515	D-4 (B)	Q2	D-5 (B)	TP1	C-5 (B)
D516	D-5 (B)	Q3	D-1 (B)	TP2	C-4 (B)
D517	E-7	Q4	C-1 (B)	TP3	F-6 (B)
D518	E-7	Q5	G-1	TP4	D-4 (B)
D701	B-7 (B)	Q6	G-1	TP5	F-6 (B)
D702	B-5 (B)	Q101	B-7 (B)	TP6	F-6 (B)
D704	C-7 (B)	Q102	C-3 (B)	TP7	C-4 (B)
		Q103	B-4 (B)	TP8	G-5 (B)
E1	F-6 (B)	Q104	B-4 (B)	TP9	F-3 (B)
E201	A-5 (B)	Q105	B-5 (B)	TP10	G-5 (B)
E401	A-2 (B)	Q106	B-4 (B)	TP11	G-5 (B)
E501	E-7 (B)	Q107	B-5	TP12	D-6 (B)
		Q201	B-7 (B)	TP101	C-4 (B)
IC1	F-4	Q202	B-4 (B)	TP201	B-4 (B)
IC2	F-1	Q203	A-5 (B)	TP301	A-3 (B)
IC3	G-5	Q204	A-5 (B)	TP401	A-3 (B)
IC4	F-3 (B)	Q205	A-4 (B)		
IC5	F-3	Q206	A-4	X1	D-1
IC6	E-4	Q207	B-4	X2	D-4
IC7	G-1	Q301	C-2 (B)	X3	F-2
IC101	B-6 (B)	Q401	B-2 (B)	X504	F-4
IC102	B-6 (B)	Q501	C-5 (B)		
IC103	B-5 (B)	Q502	C-4 (B)		
IC104	B-4 (B)	Q503	C-4 (B)		
IC105	B-5 (B)	Q504	F-7		
IC201	B-6 (B)	Q505	F-7		

NOTE  
\* : A SIDE  
\* (B) : B SIDE

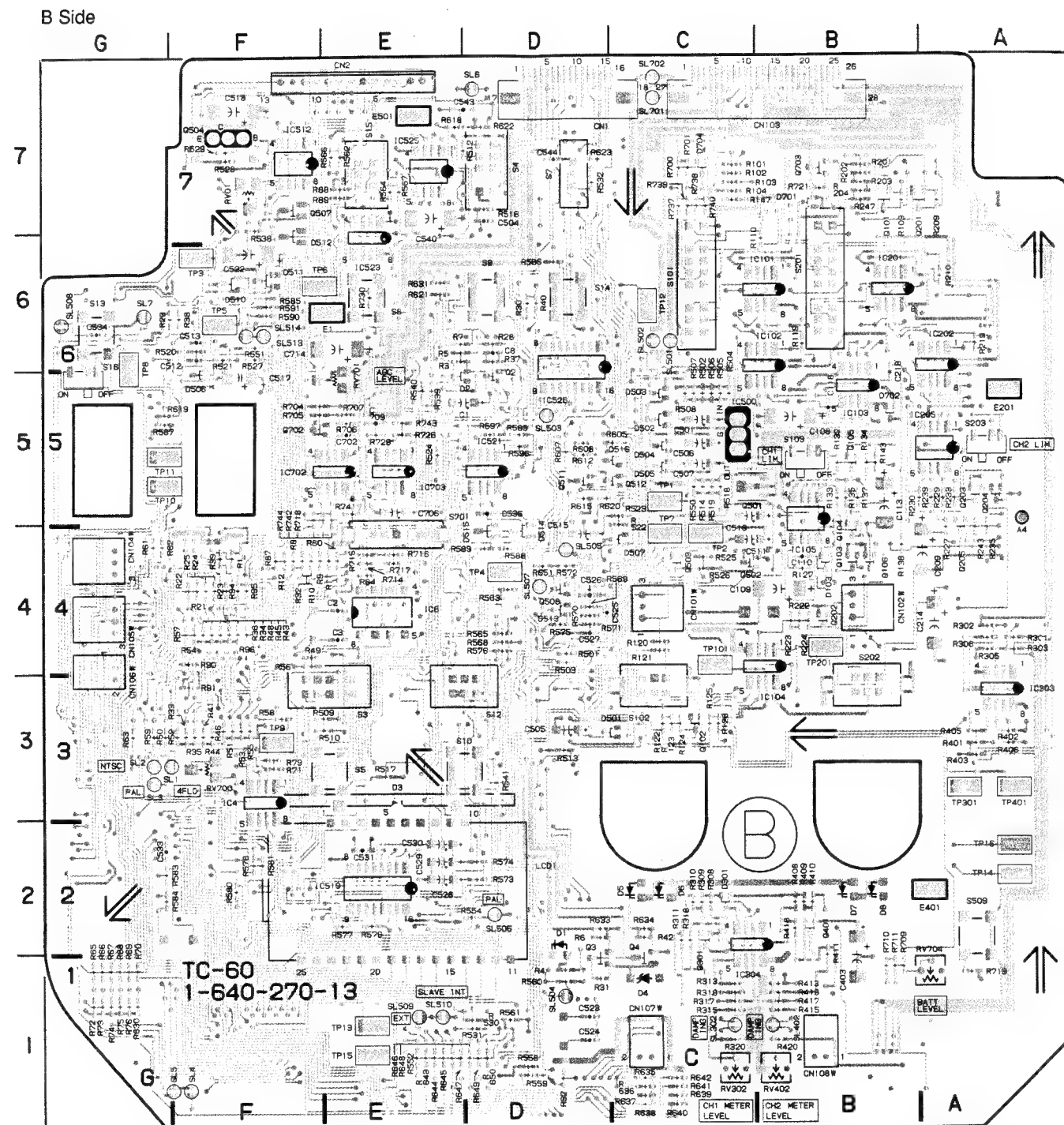


TC-60P -A SIDE-  
1-640-270-13  
PVV-1P

## TC-60P (1/3)

■ TP5 PB LTC 5Vp-p PB mode

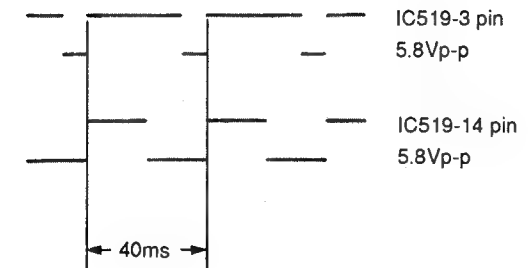
IC519-4 pin 6Vp-p REC mode



CN1-16 pin REC LTC 16Vp-p REC mode



REC mode



**TC-60P -B SIDE-**  
1-640-270-13  
PVV-1P

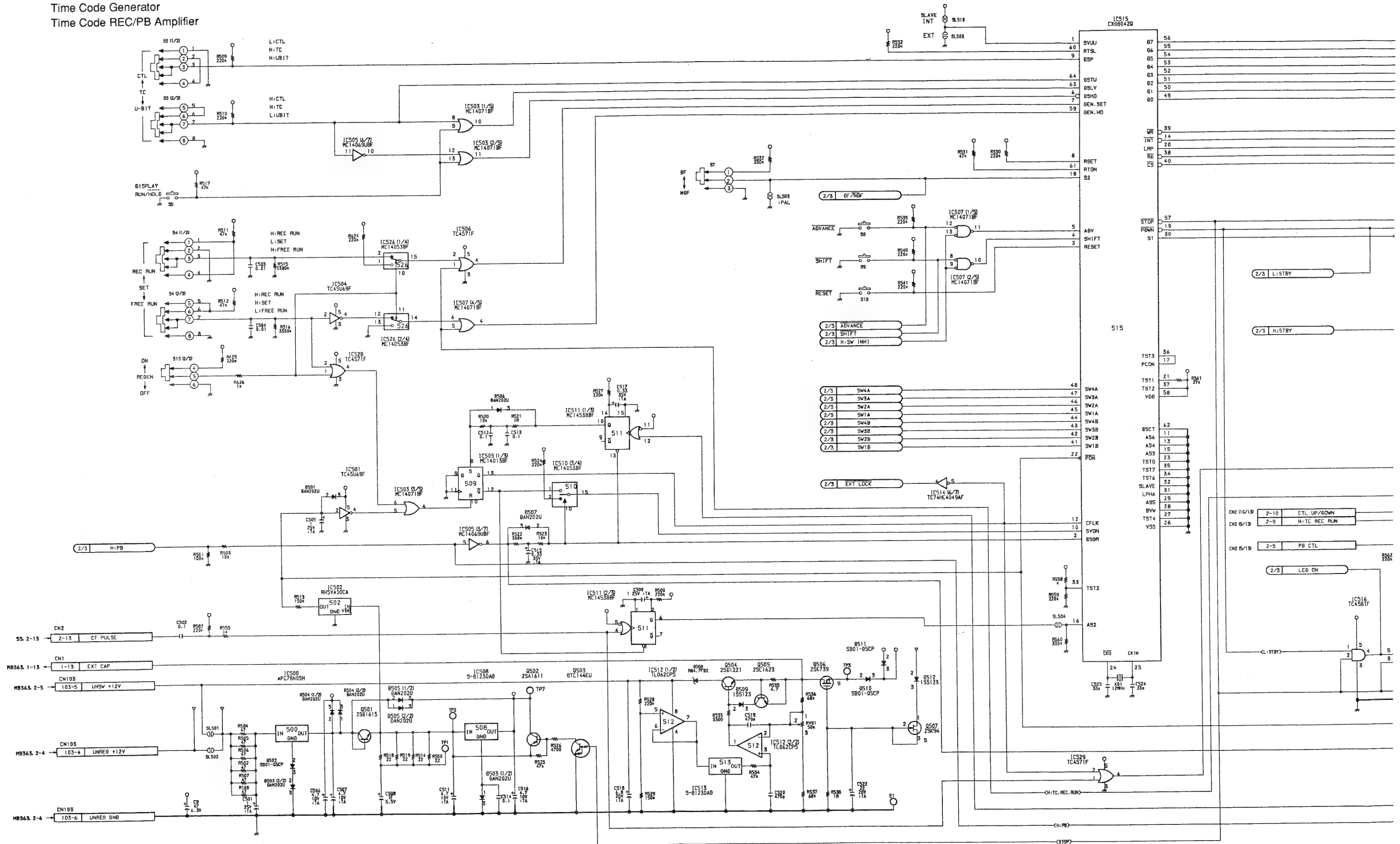
## TC-60P BOARD (1/3)

Time Code SW

Time Code Generator

Time Code REC/PB Amplifier

S/N 11421 and higher





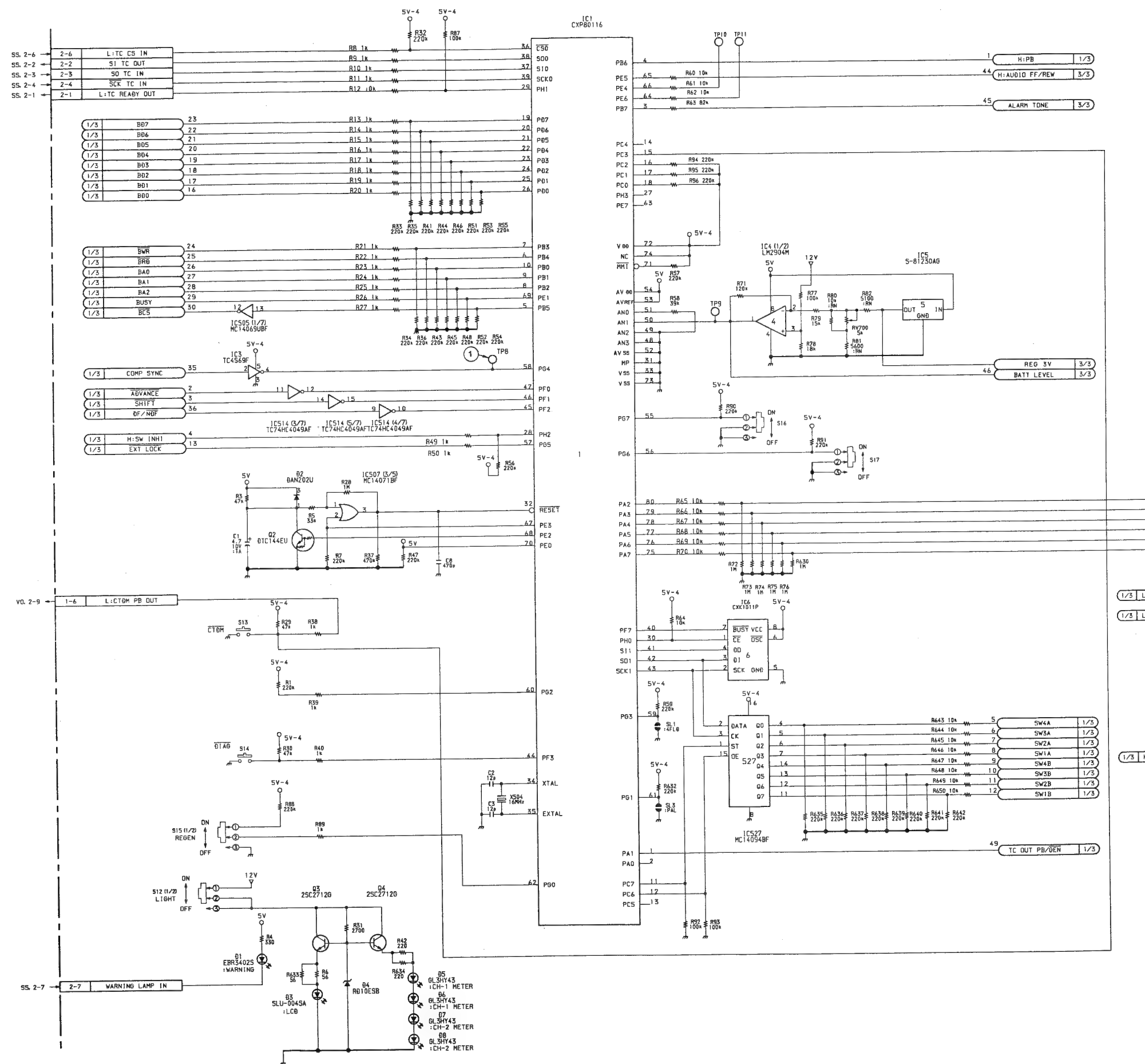
# TC-60P BOARD (2/3)

LCD Display  
VITC Insert Line Generator  
Battery Level Detect

S/N 10001 through 10100

TC-60P (2/3)

TC-60P (2/3)



11-17 (a)

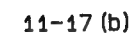
11-17 (a)



-5V:REG -5V

1-640-270-11  
PVV-1P (EK) : #10001-10100





H:PB 1/3  
DID FF/REW 3/3  
ARM TONE 3/3

REG 3V 3/3  
BATT LEVEL 3/3

SW4A 1/3  
SW3A 1/3  
SW2A 1/3  
SW1A 1/3  
SW4B 1/3  
SW3B 1/3  
SW2B 1/3  
SW1B 1/3

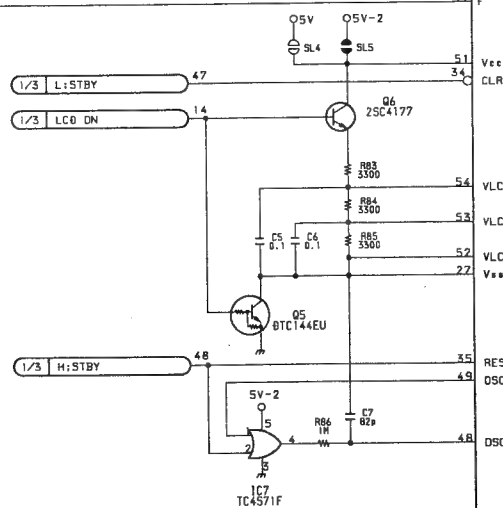
C OUT PB/GEN 1/3

IC2  
CX011280

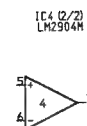
LCB1

COM0 11  
COM0 12  
COM1 13  
COM2 14  
COM3 15  
S0 16  
S1 17  
S2 18  
S3 19  
S4 20  
S5 21  
S6 22  
S7 23  
S8 24  
S9 25  
S10 26  
S11 27  
S12 28  
S13 29  
S14 30  
S15 31  
S16 32  
S17 33  
S18 34  
S19 35

1/3 003 37  
1/3 002 38  
1/3 001 39  
1/3 000 40  
1/3 0A3 31  
1/3 0A2 32  
1/3 0A1 33  
1/3 0A0 34  
1/3 0WR 15



IC		5V	5V-2	5V-4	
1	CXP80116				
2	CX011280				
3	TC45069F				
4	NJM2904M				
5	5-81230AG				
6	CXK1011P				
500	PC78N05H				
501	TC45069F				
502	RH5VA30CA				
503	MC14071BF				
504	TC45069F				
505	MC14069UBF				
506	TC4571F				
507	MC14071BF				
508	S81230AG				
509	MC14013BF				
510	MC14053BF				
511	MC14538BF				
512	TL062CP5				
513	5-81230AG				
514	TC74HC4049F				
515	CX08042Q				
516	TC4501F				
517	MC14013BF				
518	TC4501F				
519	MC14046BF				
520	CX01132Q				
521	NJM4556M				
522	MC14053BF				
523	UPC457202				
524	MC14053BF				
525	TL062CP5				
526	MC14053BF				



5V:REG +5V  
5V-2:TC +5V  
5V-3:UNSW +5V  
5V-4:BATT +5V  
12V:UNREG +12V  
12V-2:UNSW +12V  
-5V:REG -5V



IC503 (5/3)  
MC14071BF

IC505 (7/7)  
MC14069UBF

IC507 (5/3)  
MC14071BF

IC509 (3/3)  
MC14013BF

IC510 (4/4)  
MC14053BF

IC511 (3/3)  
MC14538BF

IC514 (7/7)  
TC74HC4049AF

IC517 (3/3)  
MC14013BF

IC509 (2/3)  
MC14013BF

IC519 (2/2)  
MC14046BF

IC522 (4/4)  
MC14053BF

IC524 (4/4)  
MC14053BF

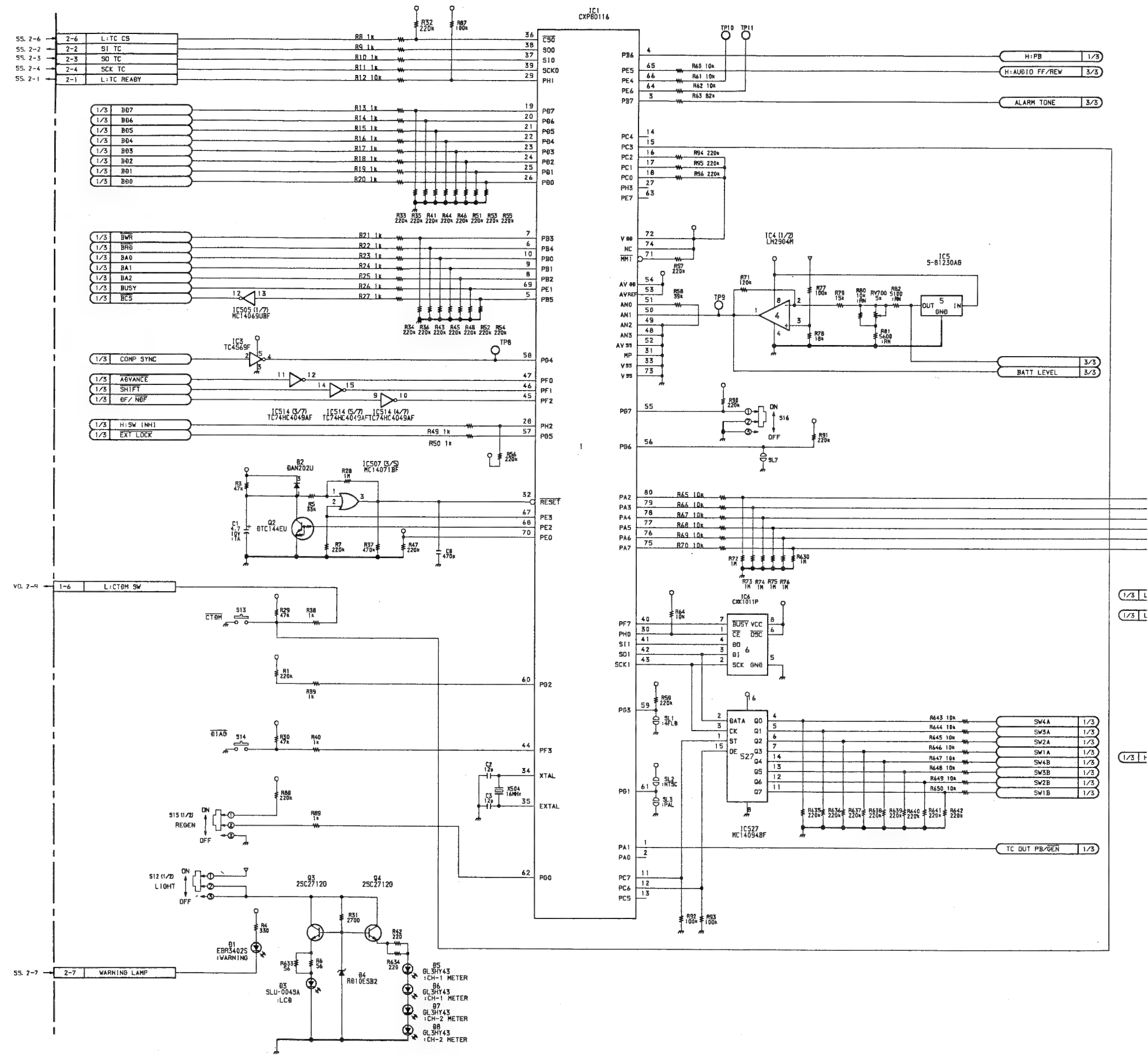
IC526 (4/4)  
MC14053BF

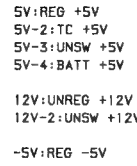
IC526 (3/4)  
MC14053BF

TC-60P BOARD (2/3)  
1-640-270-12  
PVV-1P (EK); #10101-11420

TC-60P BOARD (2/3)  
Time Code SW  
Time Code Generator  
Time Code REC/PB Amplifier

S/N 11421 and higher





IC	(5V) 5V-2(5V-4)				GND	REG GND	-5V
	+5V	+5V	BATT +5V	UNSW +12V			
1	CXP80116				3 73		
2	CXD1128Q		51				
3	TC45069F			5	3		
4	NJM2904M	8					
5	S-81230A0	2					
6	CKX1011P			6 8			
500	PC79ND05H						
501	TC45069F		5		3		
502	RM5430CA						
503	MC14071BF		14		7		
504	TC45069F				3		
505	MC14069UBF		14		7		
506	TC4571F				3		
507	MC14071BF		14		7		
508	S81230A0						
509	MC14013BF		14		7		
510	MC14053BF		16		8		
511	MC14558BF		16		8		
512	TL062CP5				B 4		
513	S-81230A0						
514	TC74HC4049F	1				8	
515	CK80842Q		58		26		
516	TC4581F						
517	MC14013BF		14		7		
518	TC4501F				3		
519	MC14044BF		16				
520	CX81132Q		33, 72		12, 52		
521	NJM4556M	8					4
522	MC14053BF	16				8	
523	UPC457202	8					4
524	MC14053BF	16				8	
525	TL062CP5	8					4
526	MC14053BF		16		8		

1

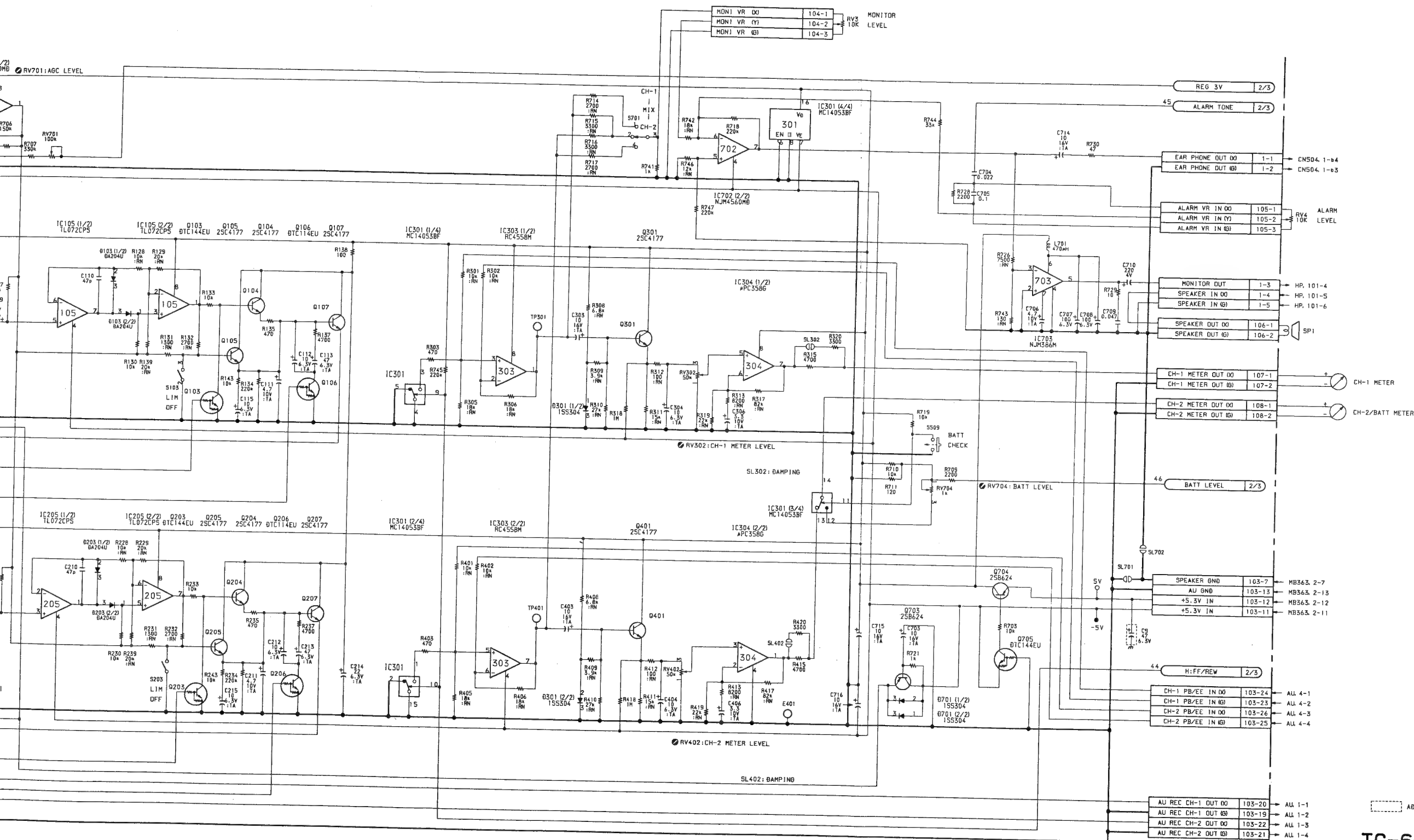
2

3

4

5

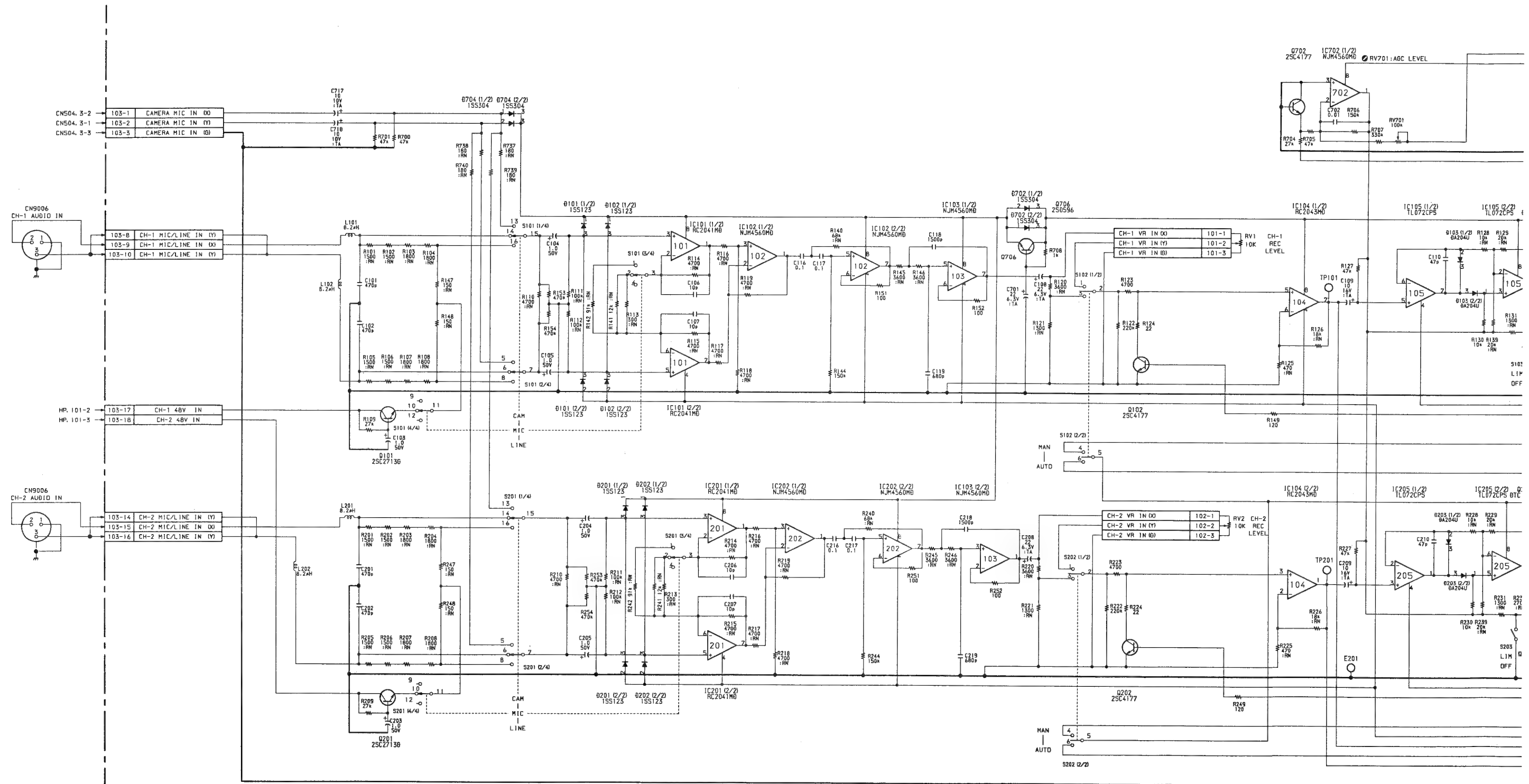


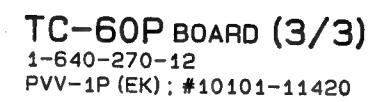


TC-60P BOARD (3/3)  
1-640-270-11  
PVV-1P (EK) ; #10001-10100

S/N 10101 through 11420

S/N 10101 through 11420



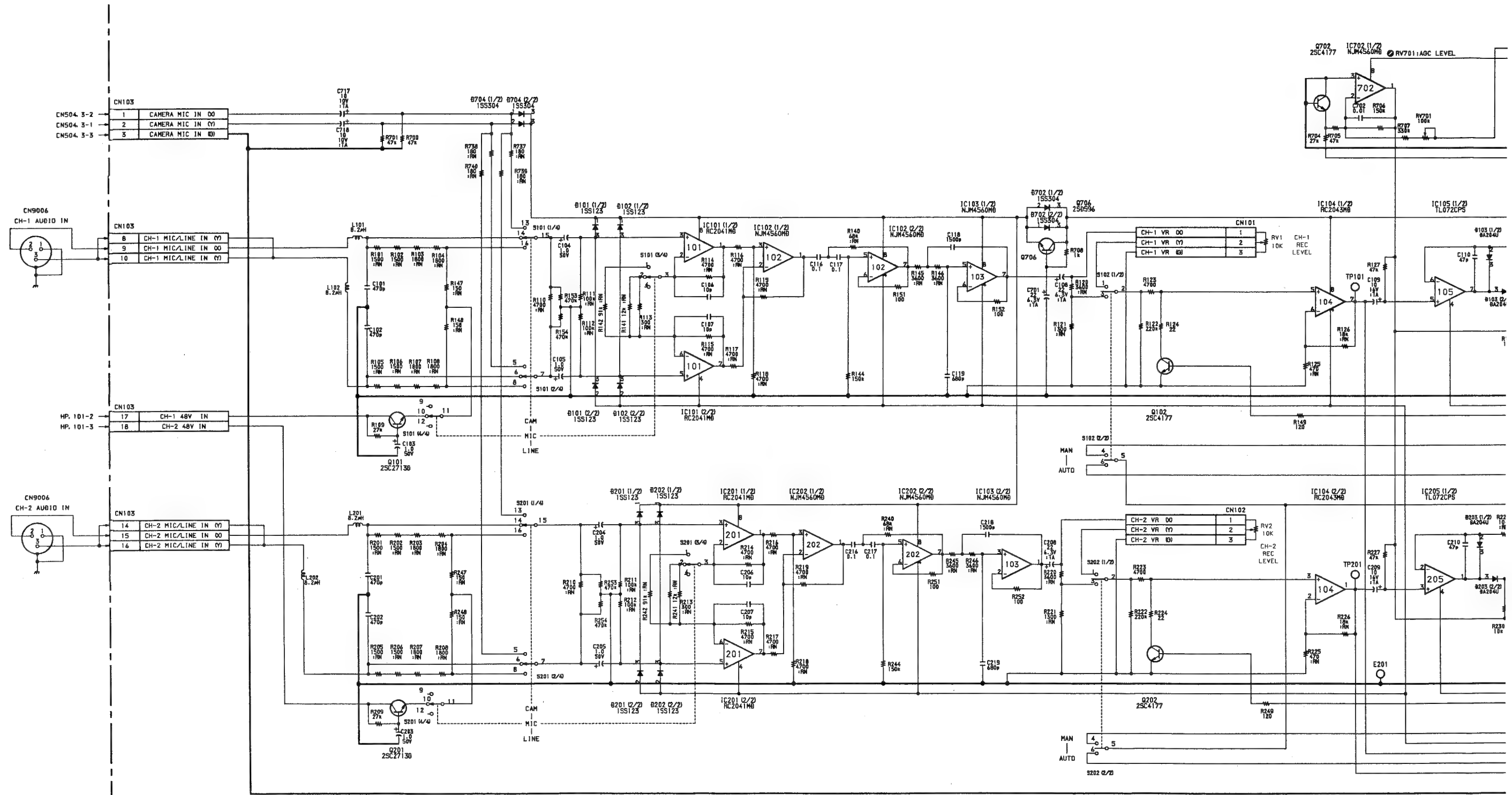


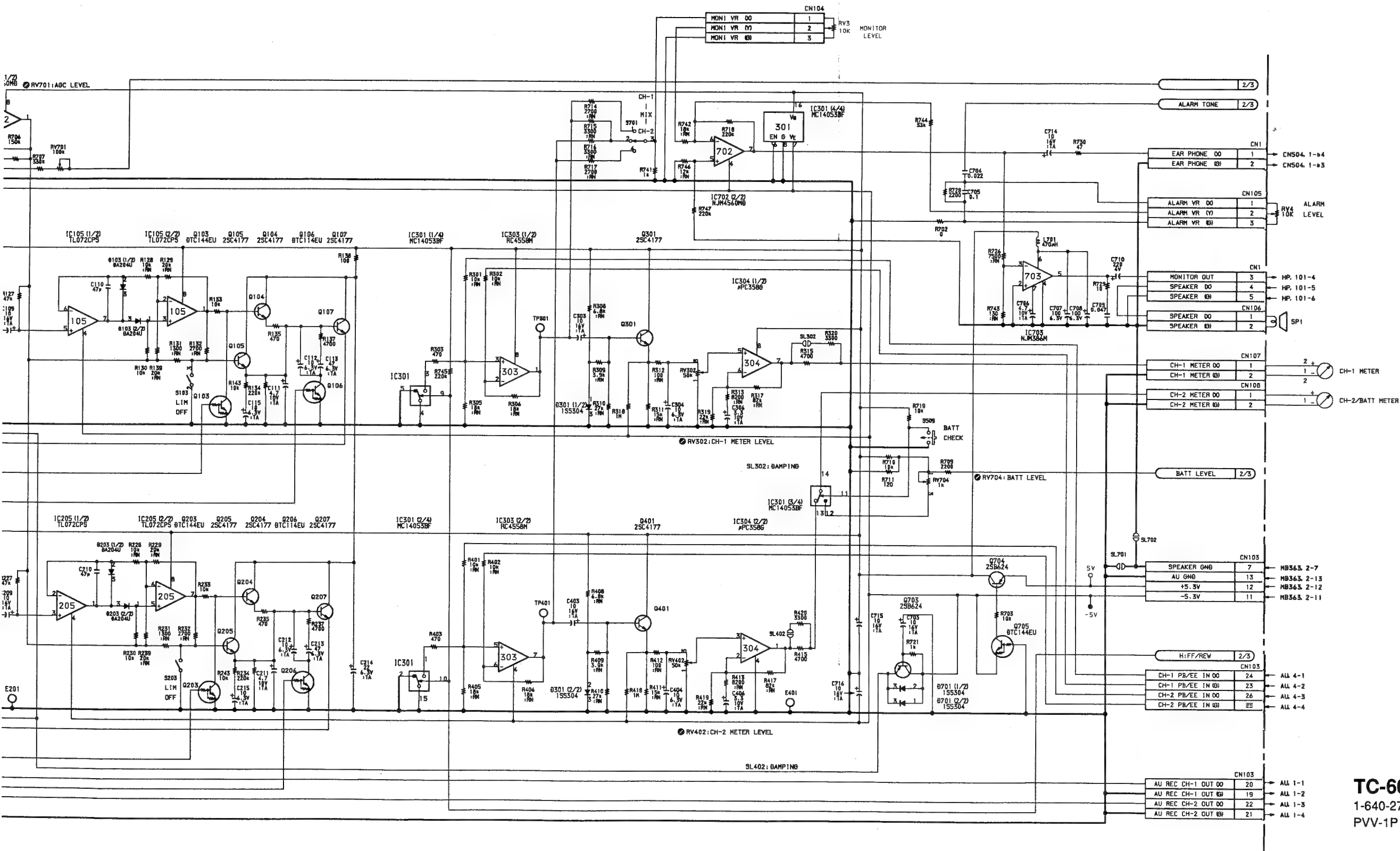


TC-60P BOARD (3/3)

S/N 11421 and higher

Time Code SW  
Time Code Generator  
Time Code REC/PB Amplifier





## TC-60P BOARD (3/3)

1-640-270-13

PVV-1P (EK) ; #11421-

CN-504 CN-504

CN-504 BOARD

Mic Amp  
Camera 50P Connector

S/N 10001 through 10500

CN504 (1-640-273-11)

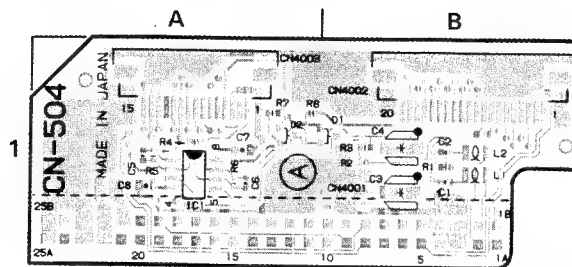
CN4001 B-1 (B)  
CN4002 B-1  
CN4003 A-1

D1 B-1  
D2 A-1

IC1 A-1

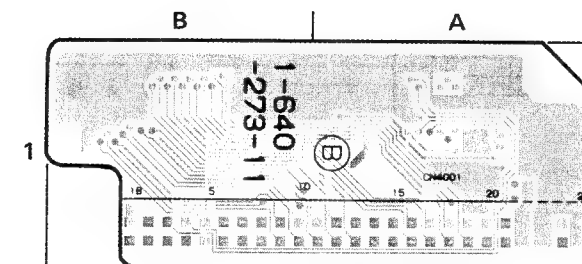
NOTE  
\*\* : \*\*A SIDE  
\*\* (B) : \*\*B SIDE

A Side



CN-504 -A SIDE-  
1-640-273-11  
PVV-1  
PVV-1P

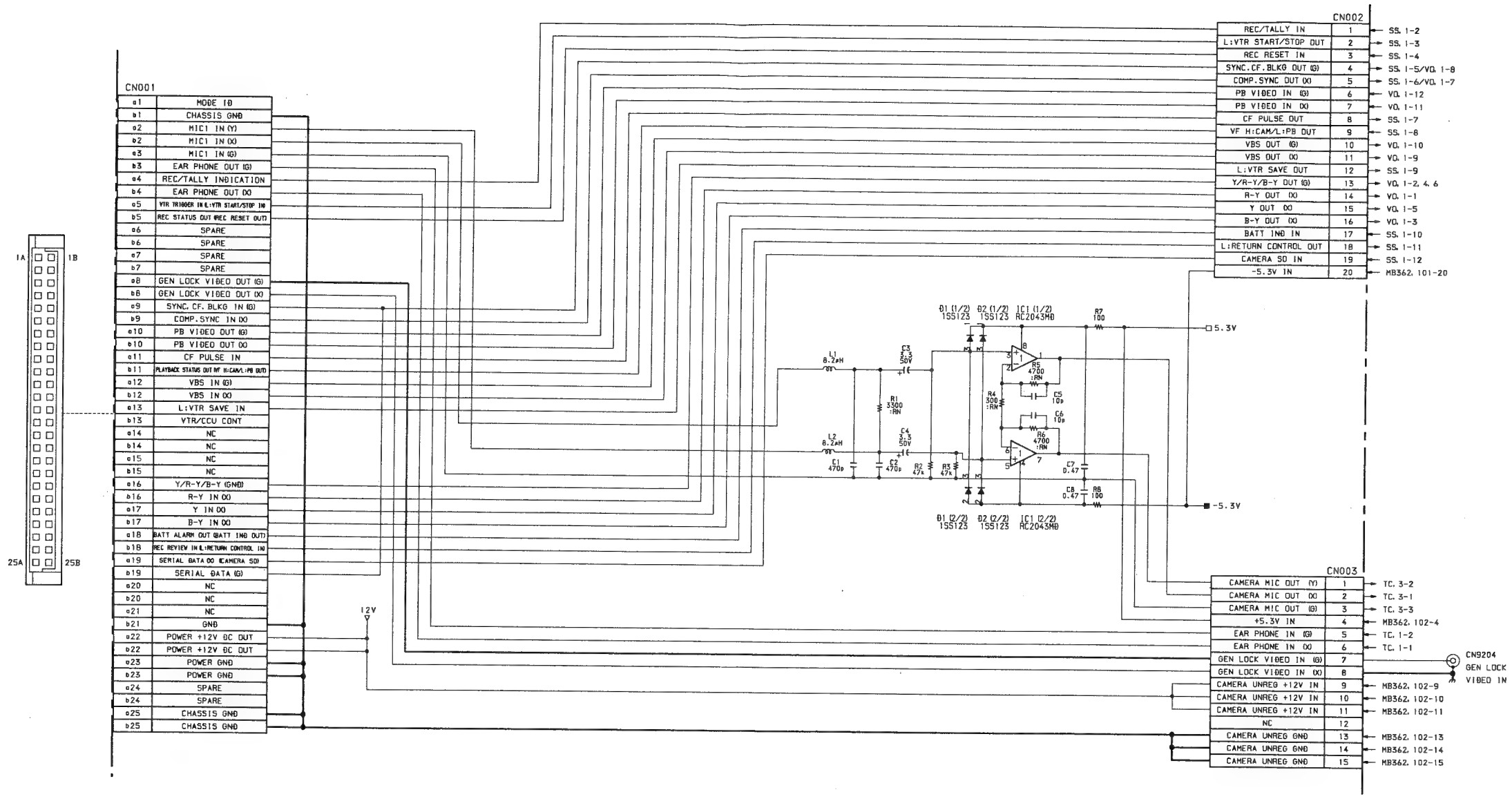
B Side



CN-504 -B SIDE-  
1-640-273-11  
PVV-1  
PVV-1P

CN-504 BOARD  
Mic Amp  
Camera 50P Connector

S/N 10001 through 10500



CN-504 BOARD  
1-640-273-11  
PVV-1 (J) : #10001-10460  
PVV-1 (UC) : #10001-10840  
PVV-1P (EK) : #10001-10500

CN-504 BOARD

Mic Amp

Camera 50P Connector

S/N 10501 and higher

CN504 (1-640-273-13)

CN4001 B-1 (B)

CN4002 B-1

CN4003 A-1

D1 B-1

D2 A-1

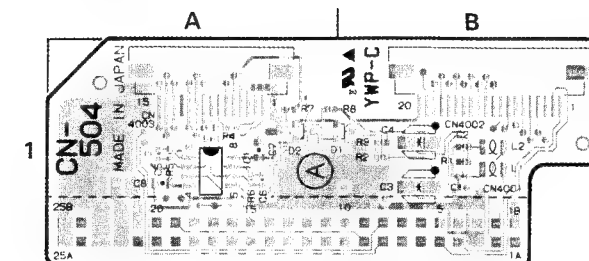
IC1 A-1

NOTE

\*\* : \*\*A SIDE

\*\* (B) : \*\*B SIDE

A Side

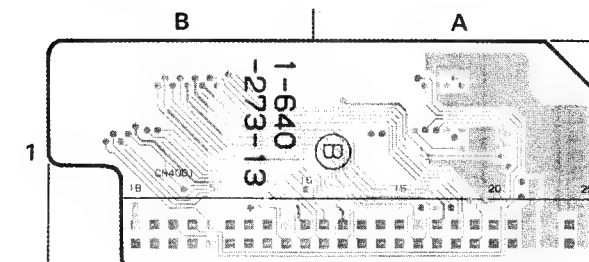


CN-504 -A SIDE-

1-640-273-13

PVV-1P

B Side



CN-504 -B SIDE-

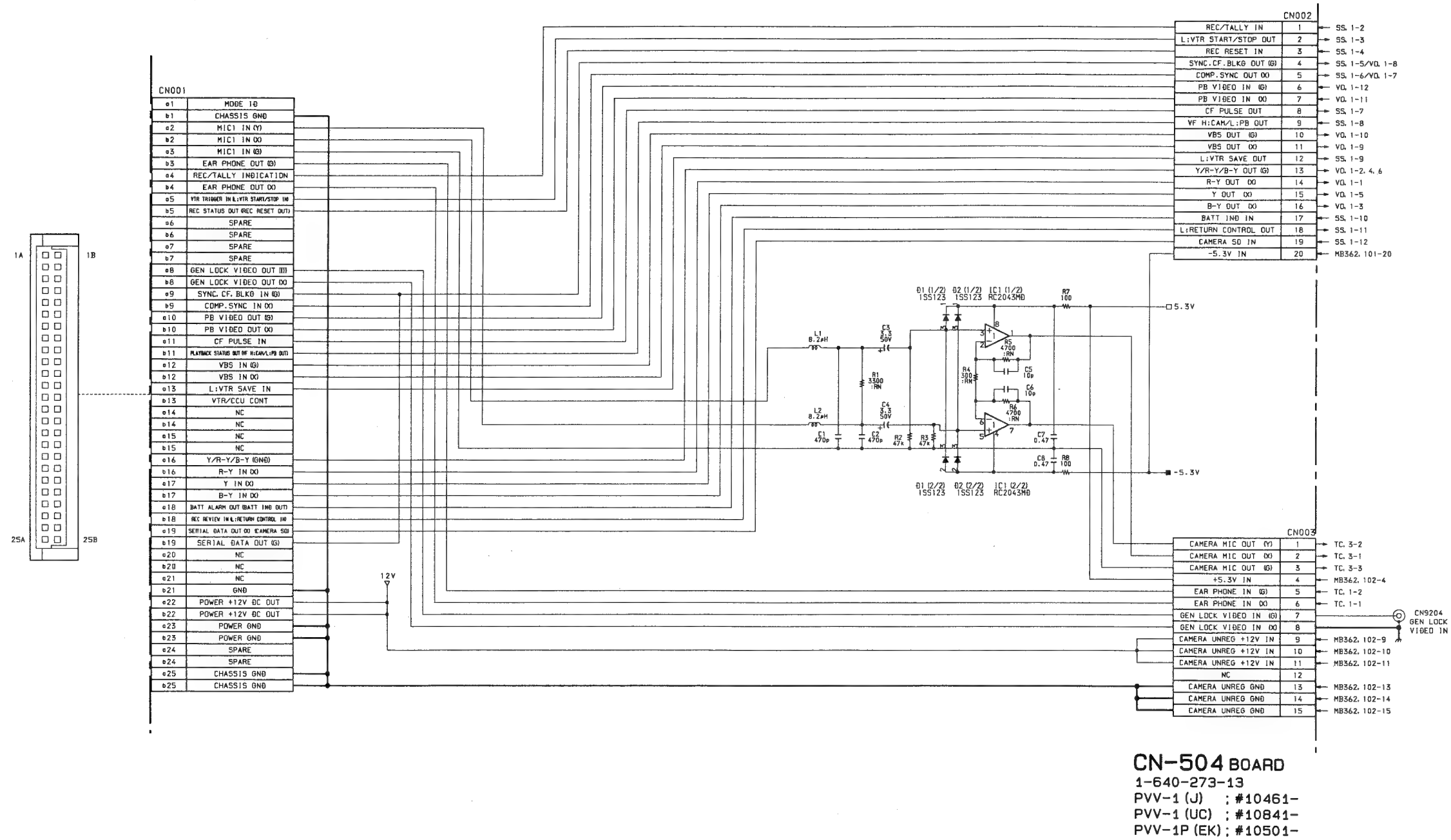
1-640-273-13

PVV-1P

## CN-504 BOARD

Mic Amp  
Camera 50P Connector

S/N 10501 and higher



## CN-504 BOARD

1-640-273-13

PVV-1 (J) ; #10461-

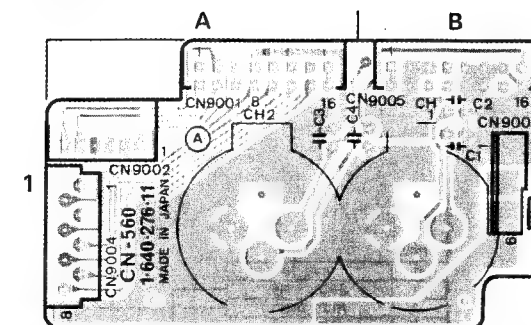
PVV-1 (UC) ; #10841-

PVV-1P (EK) ; #10501-

CN-560 (1-640-276-11)

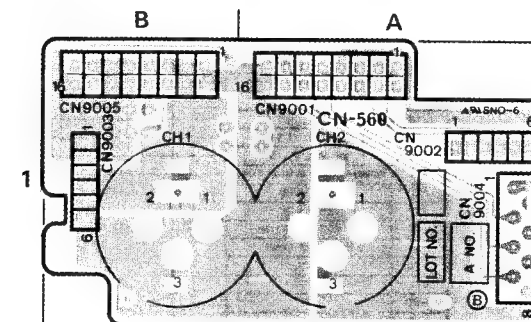
CN9001 A-1  
CN9002 A-1  
CN9003 B-1  
CN9004 A-1  
CN9005 B-1

A Side



**CN-560 -A SIDE-**  
1-640-276-11  
PVV-1  
PVV-1P

B Side

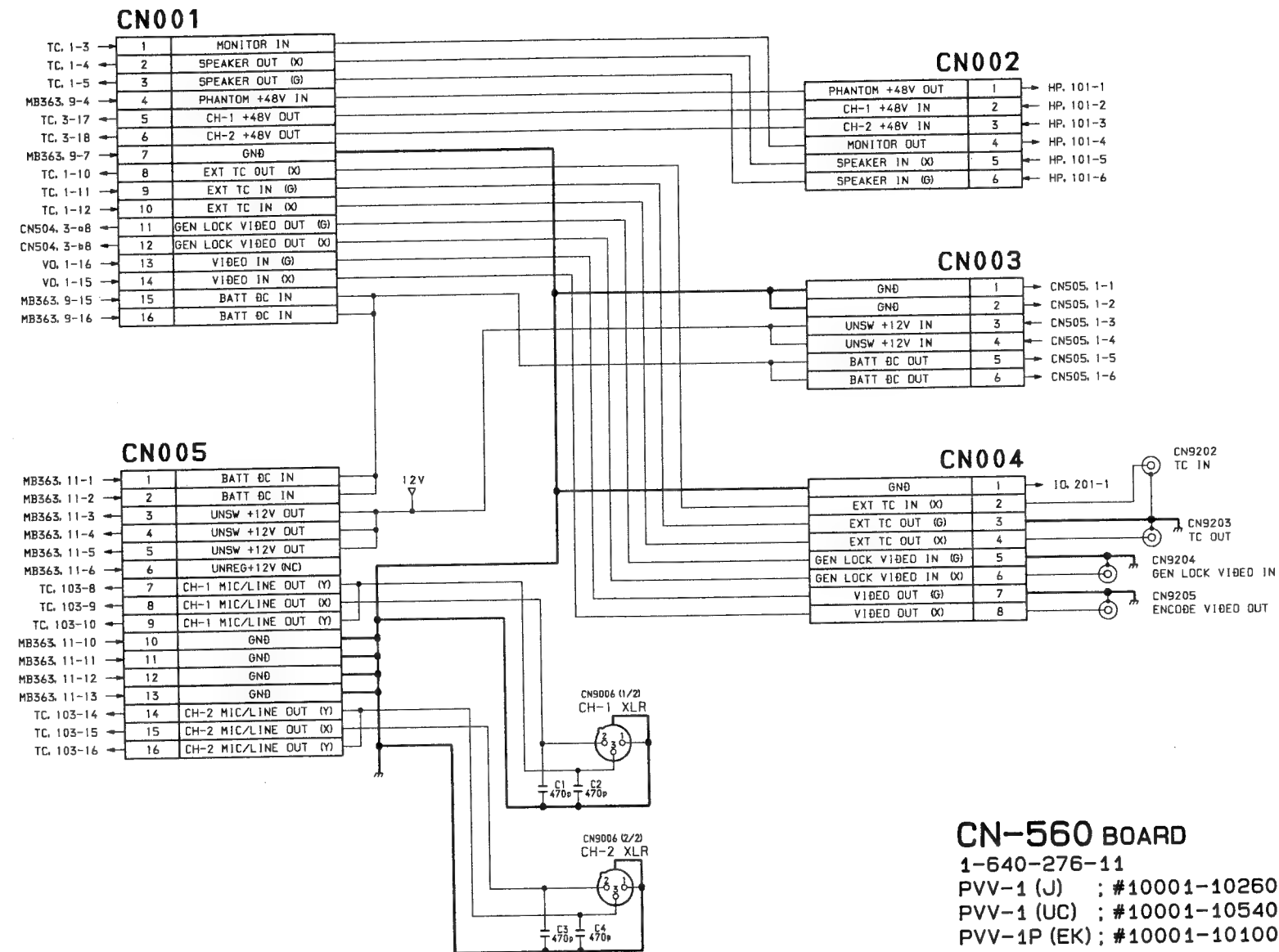


**CN-560 -B SIDE-**  
1-640-276-11  
PVV-1  
PVV-1P

**CN-560 BOARD**  
Audio XLR Connector

S/N 10001 through 10100

CN-560 CN-560



**CN-560 BOARD**  
1-640-276-11  
PVV-1 (J) : #10001-10260  
PVV-1 (UC) : #10001-10540  
PVV-1P (EK) : #10001-10100



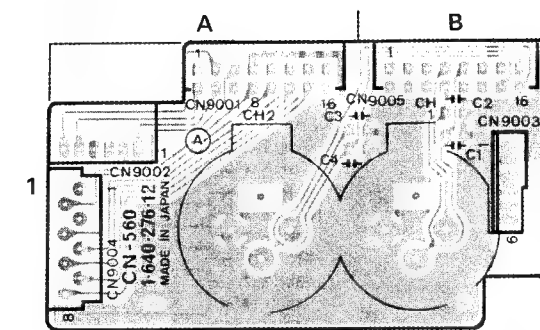
**CN-560 BOARD**  
Audio XLR Connector

S/N 10101 and higher

CN-560 (1-640-276-12)

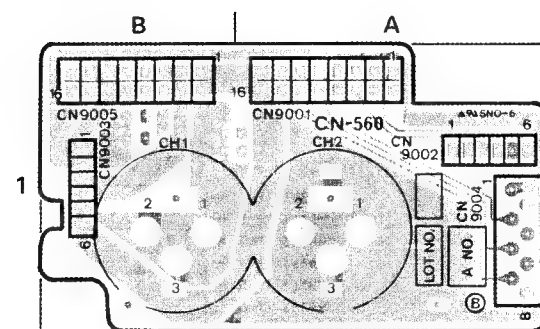
- CN9001 A-1
- CN9002 A-1
- CN9003 B-1
- CN9004 A-1
- CN9005 B-1

A Side



**CN-560 -A SIDE-**  
1-640-276-12  
PVV-1P

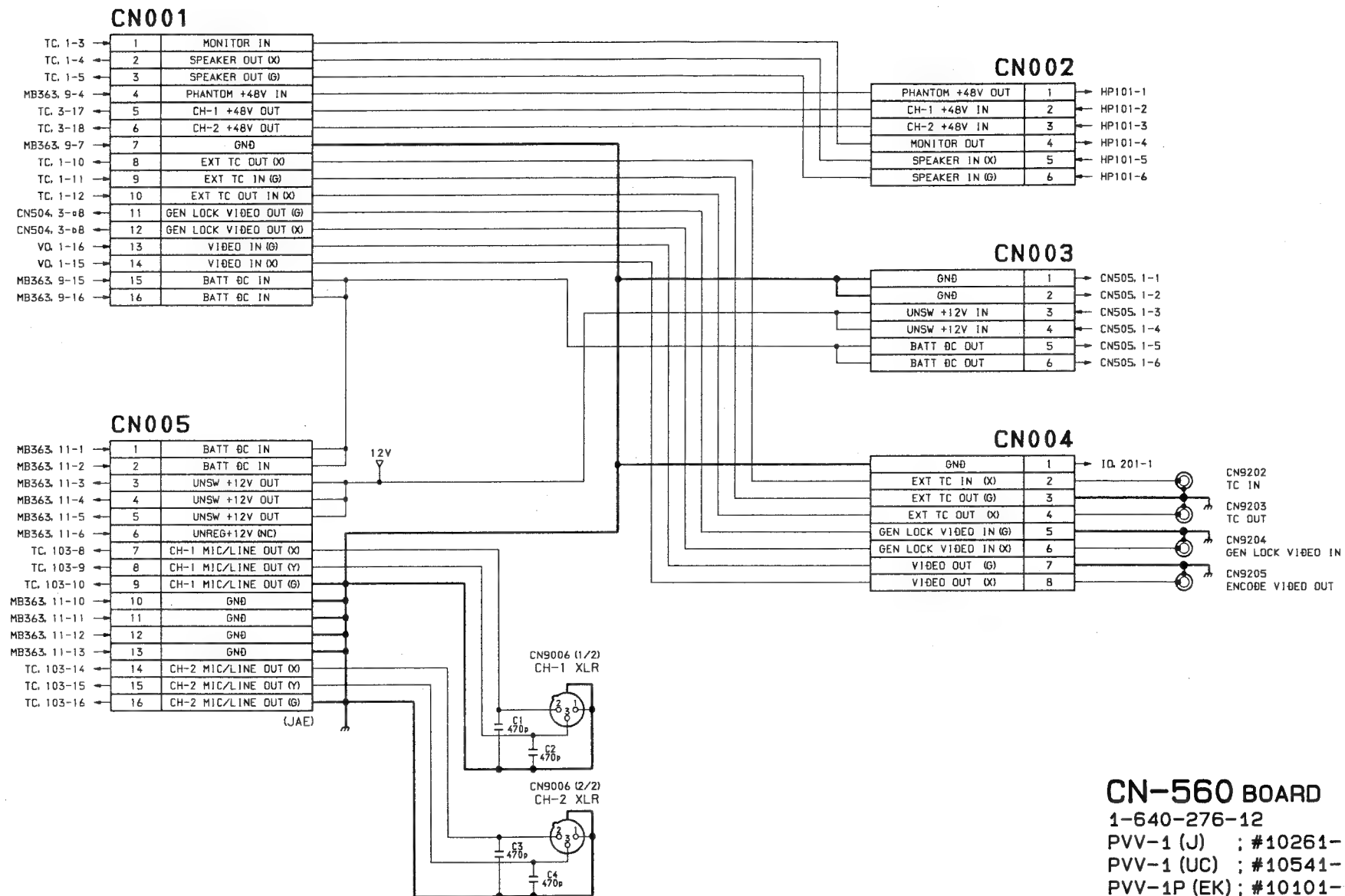
B Side



**CN-560 -B SIDE-**  
1-640-276-12  
PVV-1P

**CN-560 BOARD**  
Audio XLR Connector

S/N 10101 and higher



**CN-560 BOARD**  
1-640-276-12  
PVV-1 (J) ; #10261-  
PVV-1 (UC) ; #10541-  
PVV-1P (EK) ; #10101-

SS-46P BOARD

Servo Control  
System Control

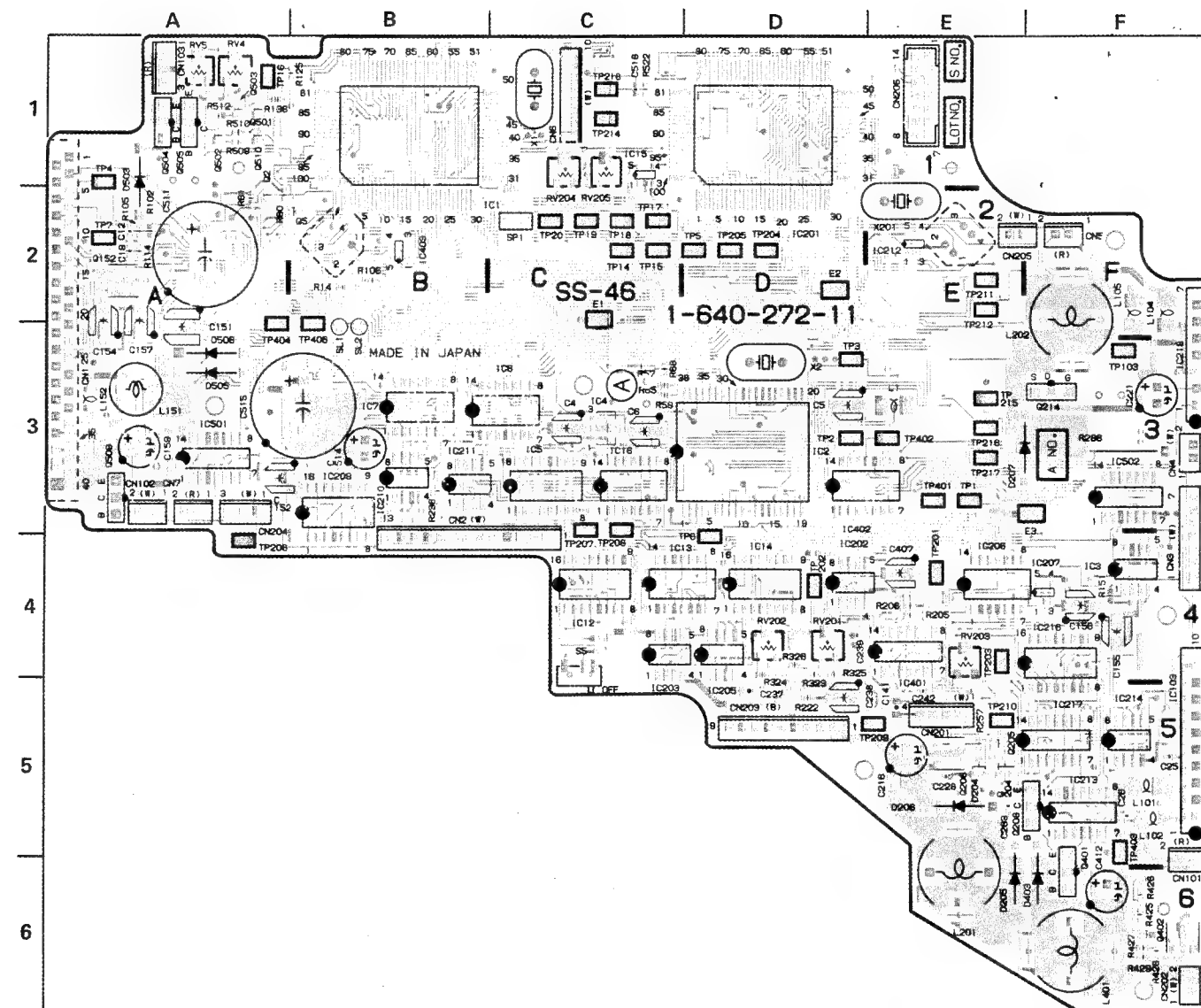
S/N 10001 through 10100

SS-46/P (1-640-272-11)

CN1	A-1 (B)	IC214	F-5	SP1	C-2
CN2	B-3	IC216	F-4	S1	F-3 (B)
CN3	F-4	IC217	F-5	S2	A-2 (B)
CN4	F-3	IC218	F-3	S3	A-3 (B)
CN5	F-2	IC401	E-4	S4	C-3 (B)
CN6	C-1	IC402	D-3	S5	C-4
CN7	A-3	IC403	B-2	TH1	E-1 (B)
CN101	F-6	IC501	A-3	TP1	E-3
CN102	A-3	IC502	F-3	TP2	D-3
CN103	A-1			TP3	D-3
CN201	E-5	PH1	B-2 (B)	TP4	A-1
CN202	F-6	PH2	E-2 (B)	TP5	D-2
CN203	D-5			TP6	D-4
CN204	A-3	Q1	C-3 (B)	TP7	A-2
CN205	E-2	Q2	A-1	TP14	C-2
CN206	E-1	Q3	E-2 (B)	TP15	C-2
		Q4	A-2 (B)	TP16	A-1
		Q5	B-2	TP17	C-2
D1	C-3 (B)	Q6	A-2 (B)	TP18	C-2
D2	D-3 (B)	Q7	A-2 (B)	TP19	C-2
D105	F-5 (B)	Q8	A-2 (B)	TP20	C-2
D202	F-5 (B)	Q9	A-3 (B)	TP103	F-3
D204	E-5	Q10	A-3 (B)	TP201	E-4
D205	E-6	Q11	A-2 (B)	TP202	D-4
D206	E-5	Q12	A-2 (B)	TP203	E-4
D207	E-3	Q13	F-5 (B)	TP204	D-2
D401	E-4 (B)	Q14	A-3 (B)	TP205	D-2
D402	D-3 (B)	Q15	B-3 (B)	TP206	A-4
D403	F-6	Q151	F-4 (B)	TP207	C-4
D501	C-3 (B)	Q152	A-2	TP208	C-4
D502	A-1 (B)	Q201	D-4 (B)	TP209	E-5
D503	A-1	Q202	C-3 (B)	TP210	E-5
D504	A-1 (B)	Q203	E-2 (B)	TP211	E-2
D505	A-3	Q204	E-5	TP212	E-2
D506	A-3	Q205	E-5	TP214	C-1
D507	A-3 (B)	Q206	E-5	TP215	E-3
D508	B-3 (B)	Q208	F-5	TP216	E-3
D509	B-3 (B)	Q209	E-5 (B)	TP217	E-3
		Q210	E-5 (B)	TP218	C-1
E1	C-2	Q211	F-3 (B)	TP401	E-3
E2	D-2	Q212	F-3 (B)	TP402	E-3
E3	F-3	Q213	D-4 (B)	TP403	F-5
		Q214	F-3	TP404	A-3
IC1	B-1	Q215	F-3 (B)	TP406	B-3
IC2	D-3	Q401	F-5		
IC3	F-4	Q402	F-6	X1	C-1
IC4	C-3	Q403	F-6	X2	D-3
IC5	C-3	Q501	A-1	X201	E-2
IC6	C-3	Q502	A-1		
IC7	B-3	Q503	A-1		
IC12	C-4	Q504	A-1		
IC13	C-4	Q505	A-1		
IC14	D-4	Q506	A-3 (B)		
IC15	C-1	Q507	A-3 (B)		
IC16	C-3	Q508	B-3 (B)		
IC103	F-5	Q509	A-3		
IC201	D-2	Q510	A-1		
IC202	D-4				
IC203	C-5				
IC205	D-5	RV4	A-1		
IC206	E-4	RV5	A-1		
IC207	F-4	RV201	D-4		
IC209	B-3	RV202	D-4		
IC210	B-3	RV203	E-4		
IC211	B-3	RV204	C-2		
IC212	E-2	RV205	C-2		
IC213	F-5	RV206	D-5 (B)		

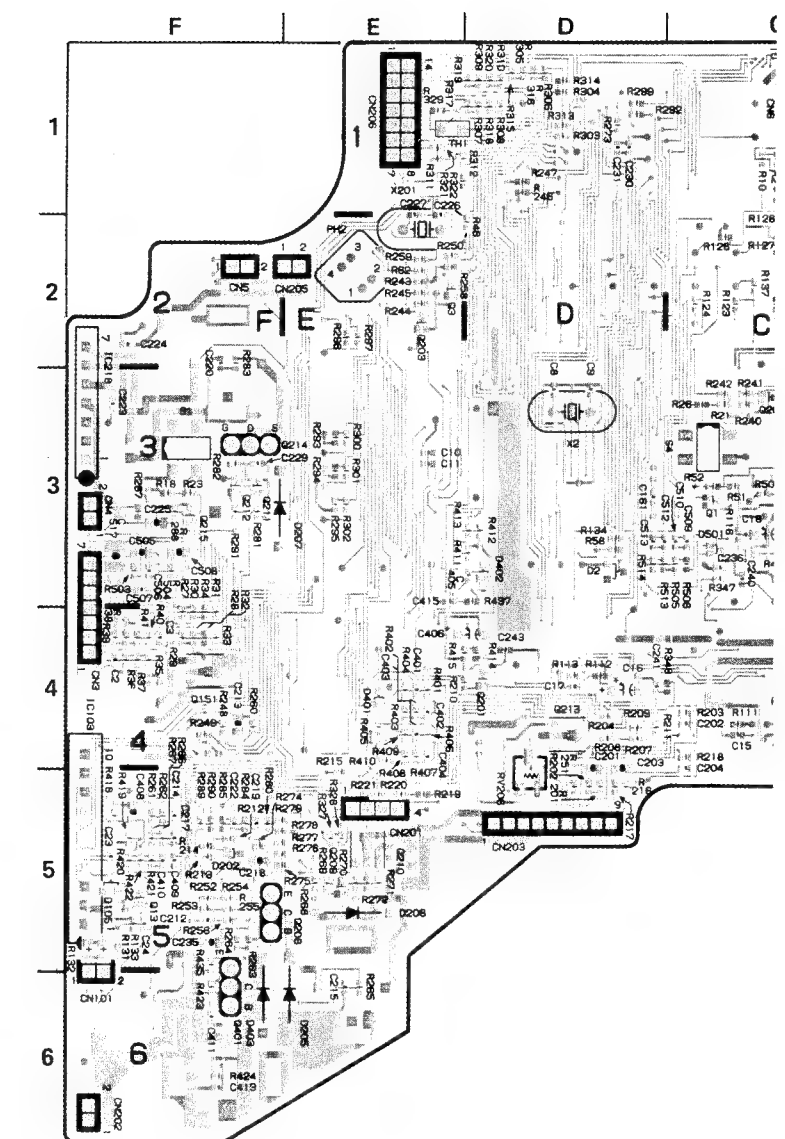
NOTE  
\* : \*A SIDE  
\*(B) : \*B SIDE

A Side

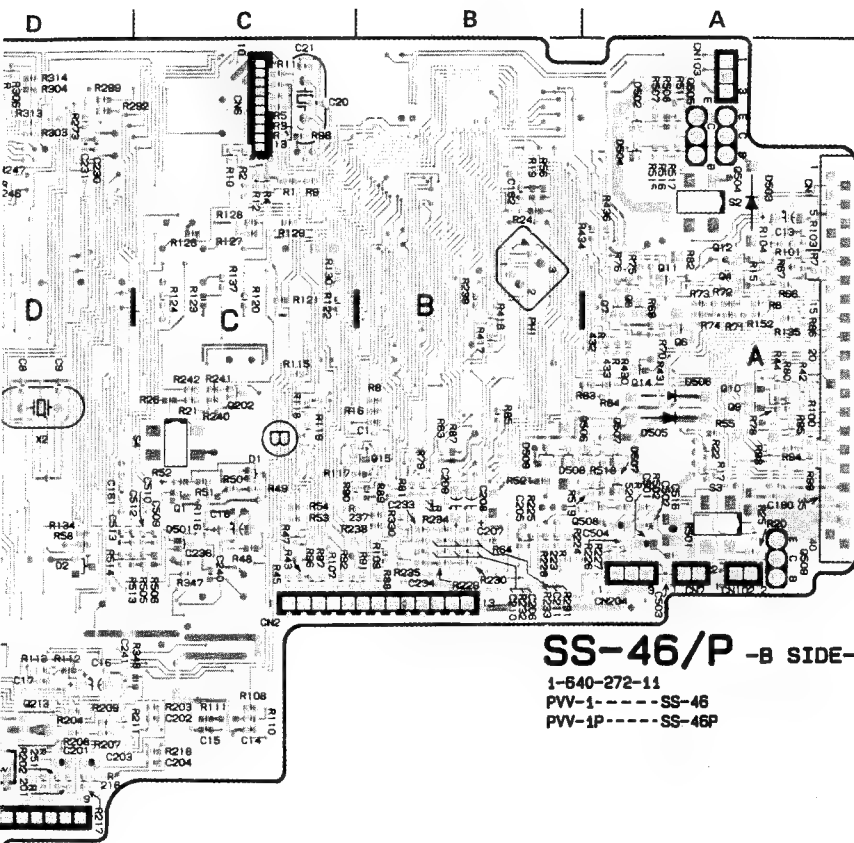


SS-46/P -A SIDE-  
1-640-272-11  
PVV-1-----SS-46  
PVV-1P-----SS-46P

B Side

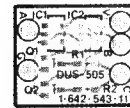


SS-46P (1/3)



DUS-505 BOARD

B Side

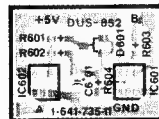


DUS-505

-B SIDE-  
1-642-543-11  
PVV-1P

DUS-852 BOARD

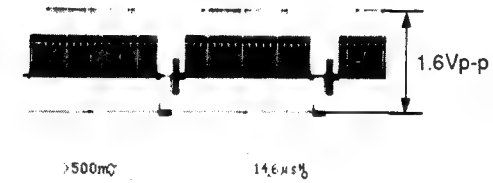
B Side



DUS-852

-B SIDE-  
1-641-735-11  
PVV-1  
PVV-1P

① ■ TP2 CHAR VIDEO DIAG mode



② ■ TP3 CHAR GEN SYNC 5.5Vp-p STANDBY mode

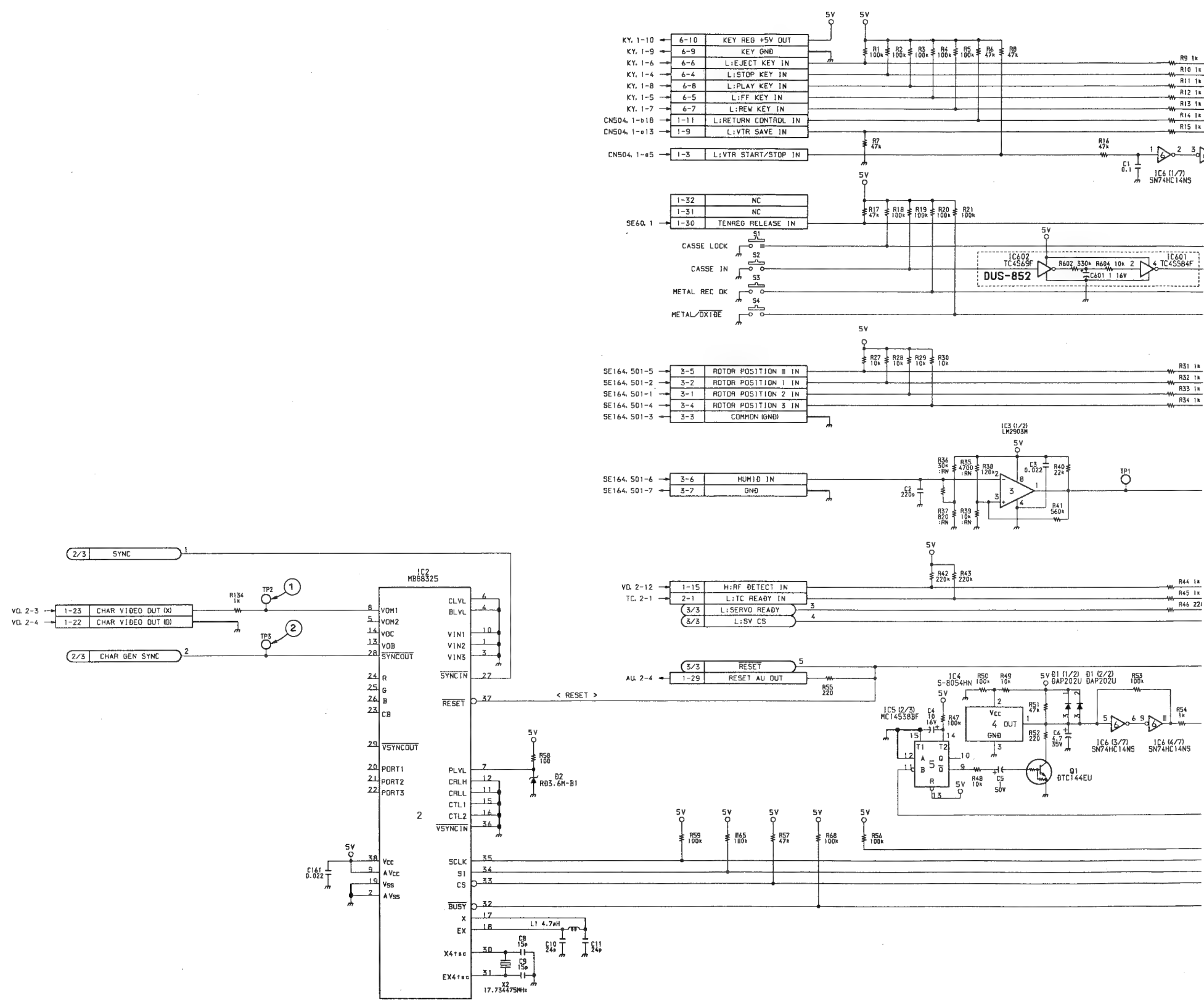


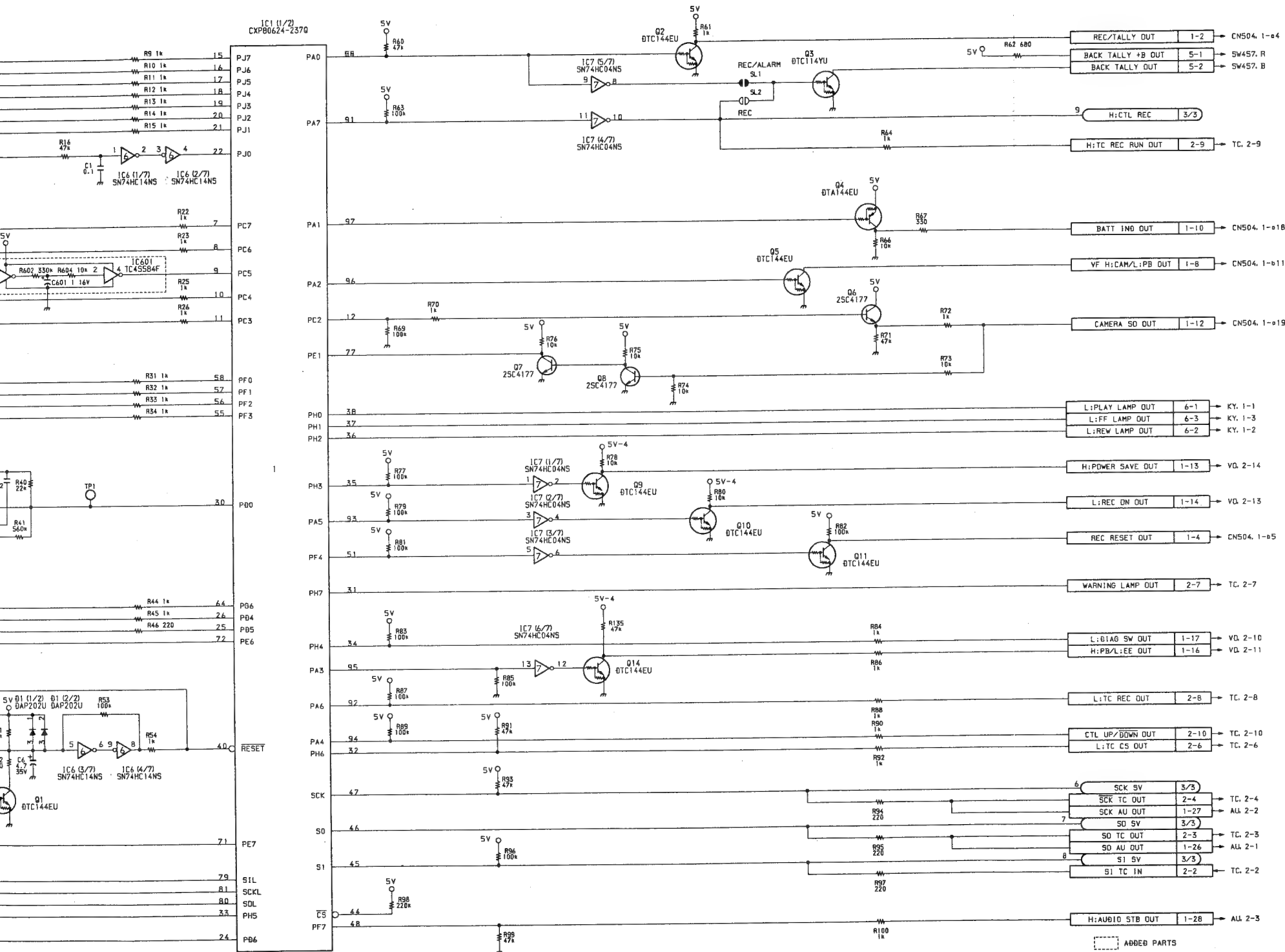
SS-46P BOARD (1/3)

System Control

Character Generator

S/N 10001 through 10100





SS-46P BOARD (1/3)  
1-640-272-11  
PVV-1P (EK) ; #10001-10100

SS-46P BOARD  
Servo Control  
System Control

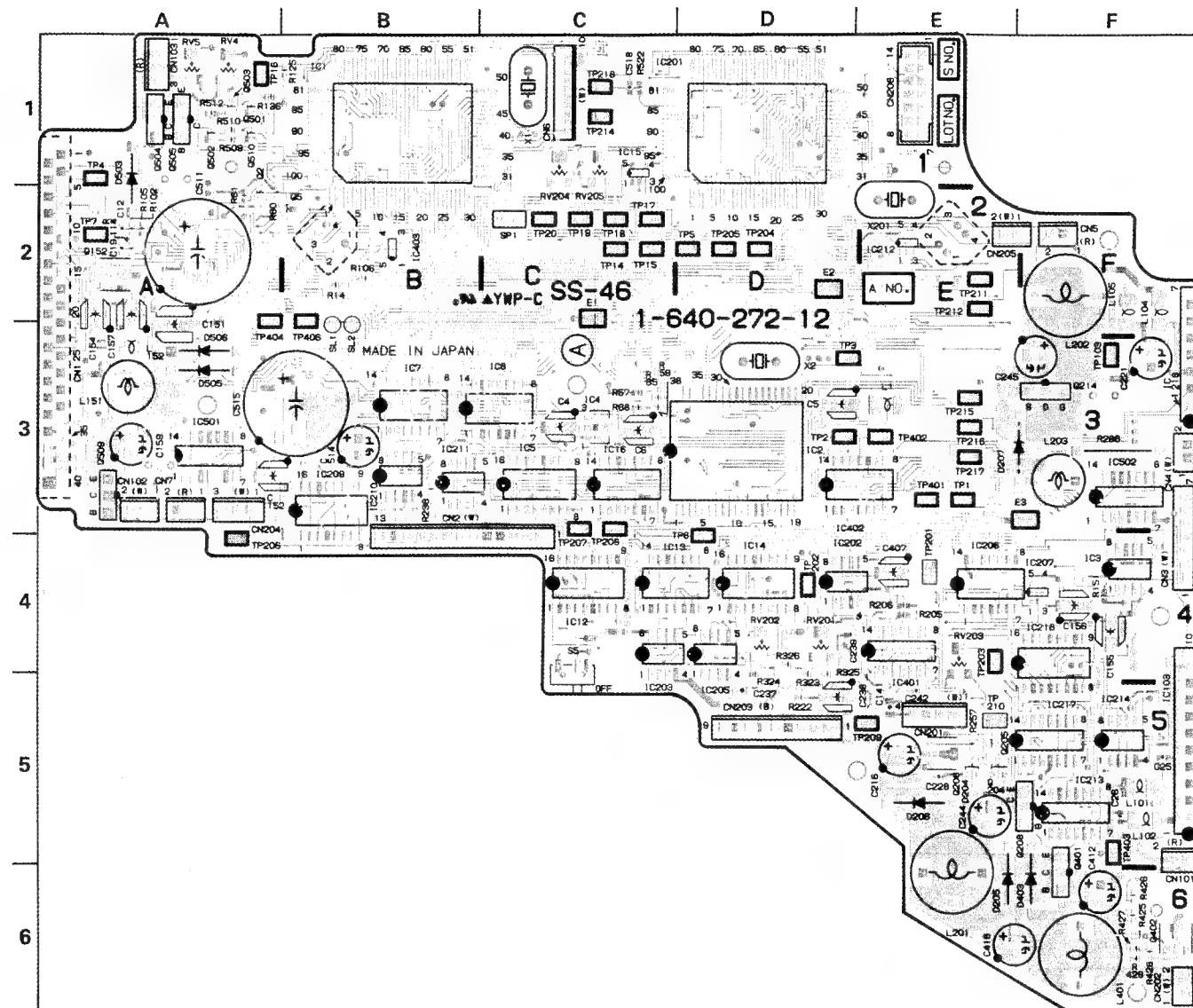
S/N 10101 through 10500

SS-46P (1-640-272-12)

CN1	A-1 (B)	IC214	F-5	SP1	C-2
CN2	B-3	IC216	F-4	S1	F-3 (B)
CN3	F-4	IC217	F-5	S2	A-2 (B)
CN4	F-3	IC218	F-3	S3	A-3 (B)
CN5	F-2	IC401	E-4	S4	C-3 (B)
CN6	C-1	IC402	D-3	S5	C-4
CN7	A-3	IC403	B-2	TH1	E-1 (B)
CN101	F-6	IC501	A-3	TP1	E-3
CN102	A-3	IC502	F-3	TP2	D-3
CN103	A-1	PH1	B-2 (B)	TP3	D-3
CN201	E-5	PH2	E-2 (B)	TP4	A-1
CN202	F-6	Q1	C-3 (B)	TP5	D-2
CN203	D-5	Q2	A-1	TP6	D-4
CN204	A-3	Q3	E-2 (B)	TP7	A-2
CN205	E-2	Q4	A-2 (B)	TP14	C-2
CN206	E-1	Q5	B-2	TP15	C-2
D1	C-3 (B)	Q6	A-2 (B)	TP16	A-1
D2	D-3 (B)	Q7	A-2 (B)	TP17	C-2
D105	F-5 (B)	Q8	A-2 (B)	TP18	C-2
D202	F-5 (B)	Q9	A-3 (B)	TP19	C-2
D204	E-5	Q10	A-3 (B)	TP20	C-2
D205	E-6	Q11	A-2 (B)	TP103	F-3
D206	E-5	Q12	A-2 (B)	TP201	E-4
D207	E-3	Q13	F-5 (B)	TP202	D-4
D401	E-4 (B)	Q14	A-3 (B)	TP203	E-4
D402	D-3 (B)	Q15	B-3 (B)	TP204	D-2
D403	F-6	Q151	F-4 (B)	TP205	D-2
D501	C-3 (B)	Q152	A-2	TP206	A-4
D502	A-1 (B)	Q201	D-4 (B)	TP207	C-4
D503	A-1	Q202	C-3 (B)	TP208	C-4
D504	A-1 (B)	Q203	E-2 (B)	TP209	E-5
D505	A-3	Q204	E-5	TP210	E-5
D506	A-3	Q205	E-5	TP211	E-2
D507	A-3 (B)	Q206	E-5	TP212	E-2
D508	B-3 (B)	Q208	F-5	TP214	C-1
D509	B-3 (B)	Q209	E-5 (B)	TP215	E-3
E1	C-2	Q210	E-5 (B)	TP216	E-3
E2	D-2	Q211	F-3 (B)	TP217	E-3
E3	F-3	Q212	F-3 (B)	TP218	C-1
IC1	B-1	Q213	D-4 (B)	TP401	E-3
IC2	D-3	Q214	F-3	TP402	E-3
IC3	F-4	Q215	F-3 (B)	TP403	F-5
IC4	C-3	Q401	F-5	TP404	A-3
IC5	C-3	Q402	F-6	TP406	B-3
IC6	C-3	Q403	F-6	X1	C-1
IC7	B-3	Q501	A-1	X2	D-3
IC12	C-4	Q502	A-1	X201	E-2
IC13	C-4	Q503	A-1		
IC14	D-4	Q504	A-1		
IC15	C-1	Q505	A-1		
IC16	C-3	Q506	A-3 (B)		
IC103	F-5	Q507	A-3 (B)		
IC201	C-1	Q508	B-3 (B)		
IC202	D-4	Q509	A-3		
IC203	C-5	Q510	A-1		
IC205	D-5	RV4	A-1		
IC206	E-4	RV5	A-1		
IC207	F-4	RV201	D-4		
IC209	B-3	RV202	D-4		
IC210	B-3	RV203	E-4		
IC211	B-3	RV204	C-2		
IC212	E-2	RV205	C-2		
IC213	F-5	RV206	D-5 (B)		

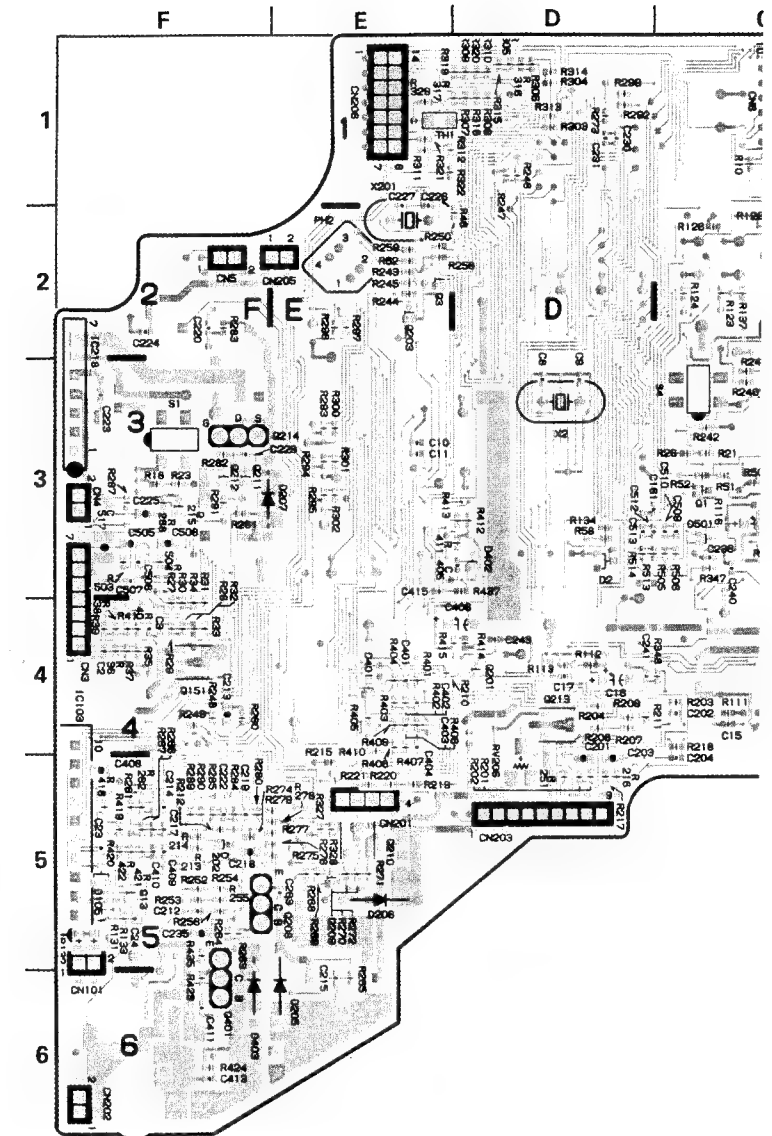
NOTE  
--\* : --\*A SIDE  
--\*(B); --\*B SIDE

A Side

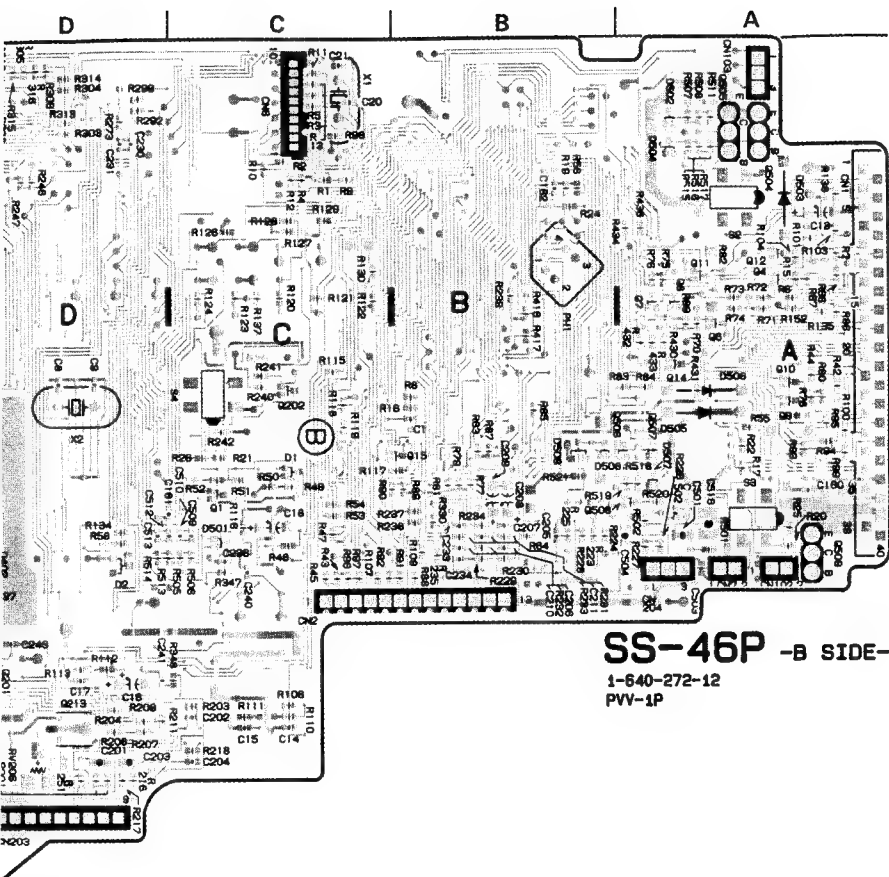


SS-46P -A SIDE-  
1-640-272-12  
PVV-1P

B Side

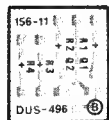


SS-46P (1/3)



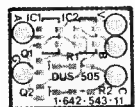
**SS-46P -B SIDE-**  
1-640-272-12  
PVV-1P

**DUS-496 BOARD**  
B Side



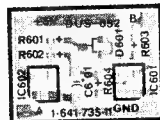
**DUS-496**  
-B SIDE-  
1-642-156-11  
PVV-1P

**DUS-505 BOARD**  
B Side



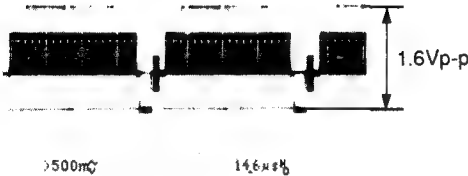
**DUS-505**  
-B SIDE-  
1-642-543-11  
PVV-1P

**DUS-852 BOARD**  
B Side



**DUS-852**  
-B SIDE-  
1-641-735-11  
PVV-1  
PVV-1P

① ■ TP2 CHAR VIDEO DIAG mode



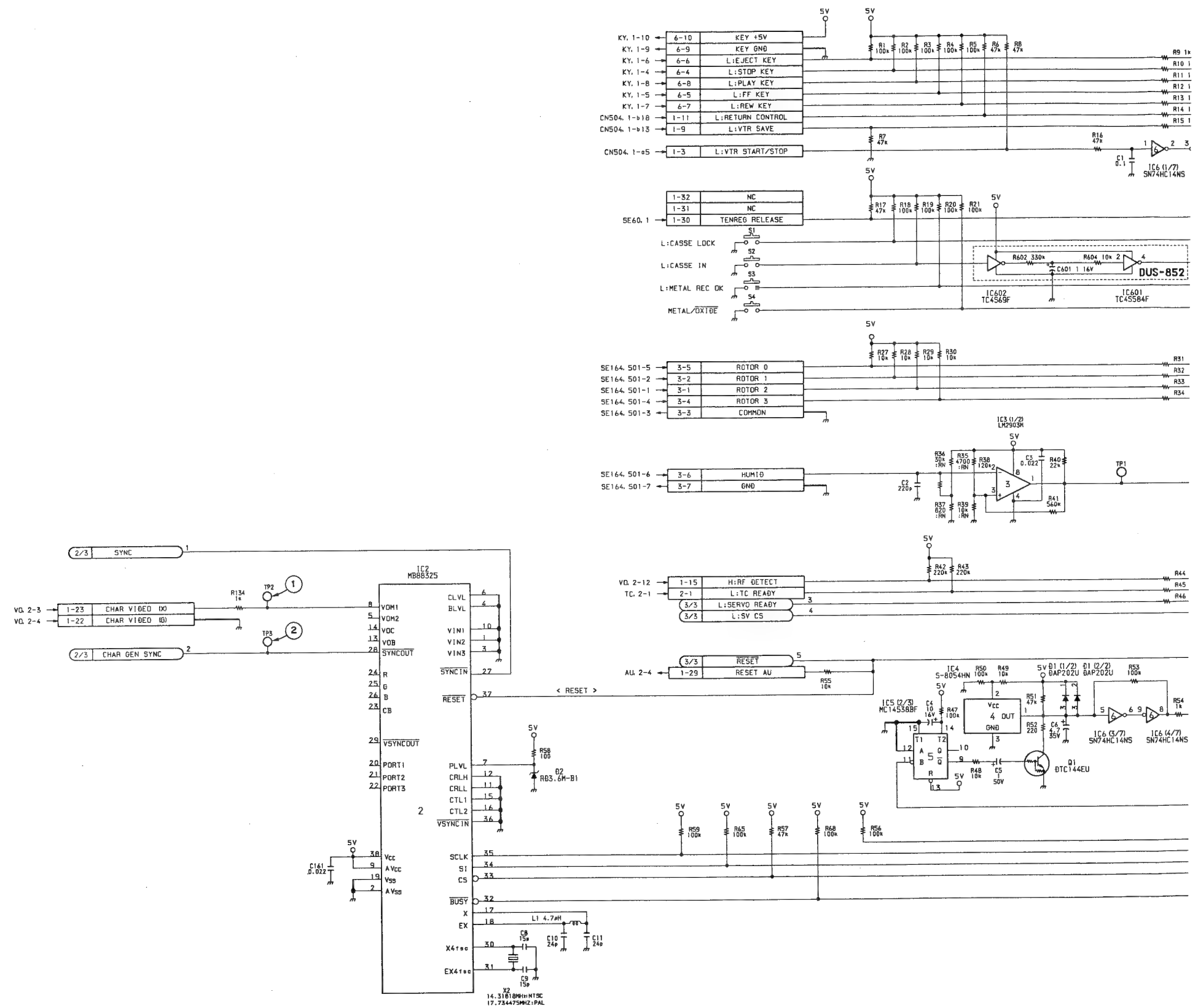
② ■ TP3 CHAR GEN SYNC 5.5Vp-p STANDBY mode





**SS-46P BOARD (1/3)**  
System Control  
Character Generator

S/N 10101 through 10500





## SS-46P BOARD

Servo Control  
System Control

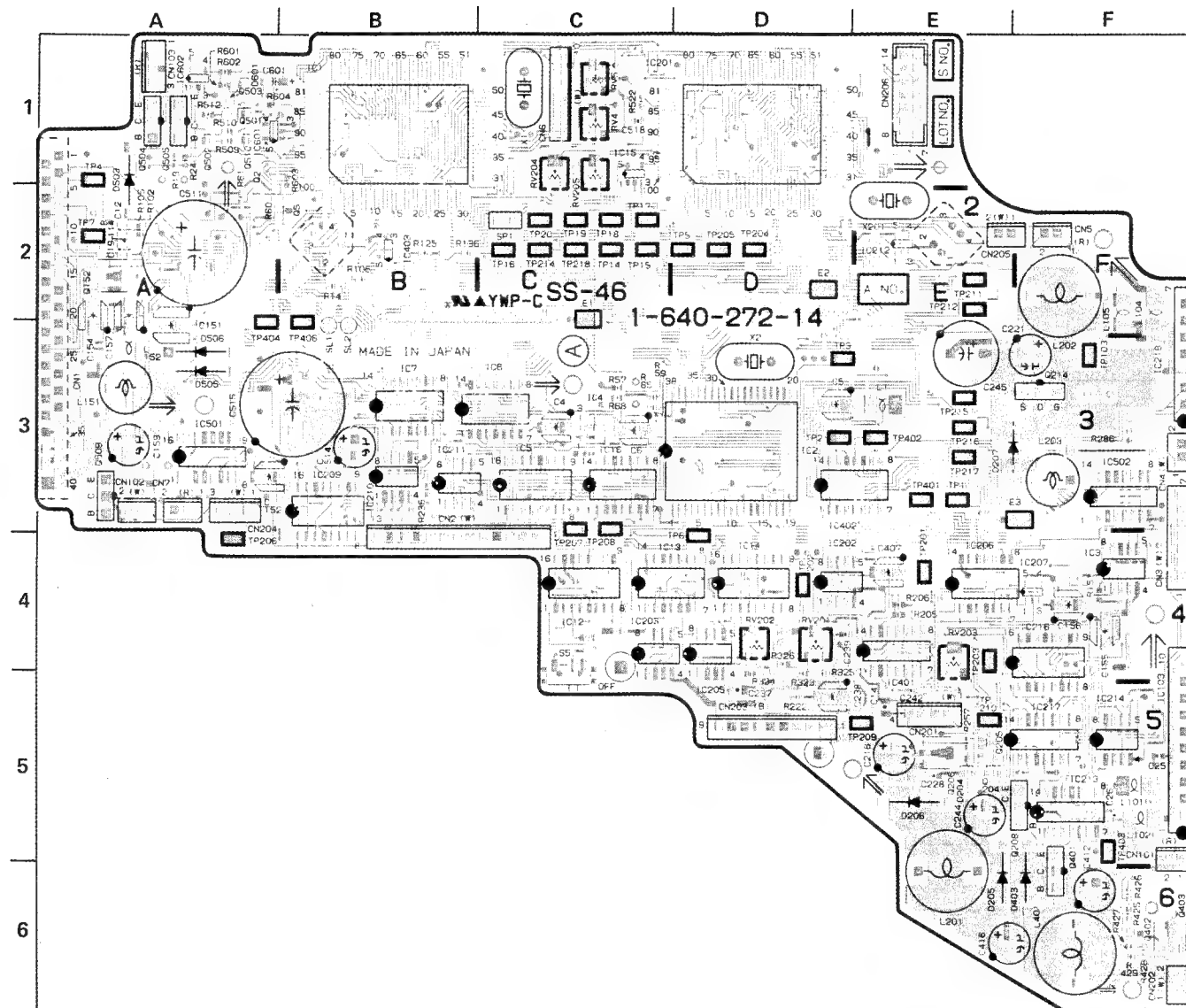
S/N 10501 through 12390

## SS-46P (1-640-272-14)

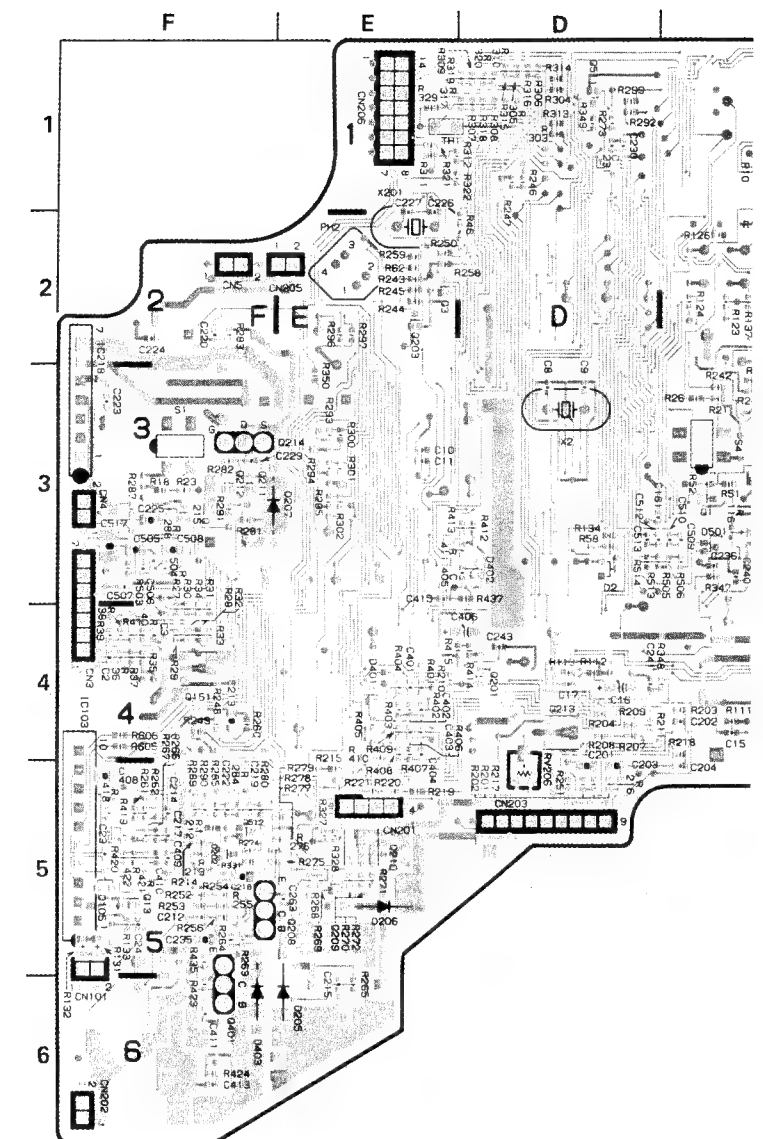
CN1	A-1 (B)	IC214	F-5	RV203	E-4
CN2	B-3	IC216	F-4	RV204	C-1
CN3	F-4	IC217	F-5	RV205	C-2
CN4	F-3	IC218	F-3	RV206	D-5 (B)
CN5	F-2	IC401	E-4		
CN6	C-1	IC402	D-3	SP1	C-2
CN7	A-3	IC403	B-2		
CN101	F-6	IC501	A-3	S1	F-3 (B)
CN102	A-3	IC502	F-3	S2	A-2 (B)
CN103	A-1	IC601	A-1	S3	A-3 (B)
CN201	E-5	IC602	A-1	S4	C-3 (B)
CN202	F-6			S5	C-4
CN203	D-5	PH1	B-2 (B)	TH1	E-1 (B)
CN204	A-4	PH2	E-2 (B)		
CN205	E-2				
CN206	E-1	Q1	C-3 (B)	TP1	E-3
		Q2	A-1	TP2	D-3
D1	C-3 (B)	Q3	E-2 (B)	TP3	D-3
D2	D-3 (B)	Q4	A-2 (B)	TP4	A-1
D105	F-5 (B)	Q5	B-2	TP5	D-2
D202	F-5 (B)	Q6	A-2 (B)	TP6	D-4
D204	E-5	Q7	A-2 (B)	TP7	A-2
D205	E-6	Q8	A-2 (B)	TP14	C-2
D206	E-5	Q9	A-3 (B)	TP15	C-2
D207	E-3	Q10	A-3 (B)	TP16	C-2
D401	E-4 (B)	Q11	A-2 (B)	TP17	C-2
D402	D-3 (B)	Q12	A-2 (B)	TP18	C-2
D403	F-6	Q13	F-5 (B)	TP19	C-2
D501	C-3 (B)	Q14	A-3 (B)	TP20	C-2
D502	A-1 (B)	Q15	B-3 (B)	TP103	F-3
D503	A-1	Q151	F-4 (B)	TP201	E-4
D504	A-1 (B)	Q152	A-2	TP202	D-4
D505	A-3	Q201	D-4 (B)	TP203	E-4
D506	A-3	Q202	C-3 (B)	TP204	D-2
D507	A-3 (B)	Q203	E-2 (B)	TP205	D-2
D508	B-3 (B)	Q204	E-5	TP206	A-4
D509	B-3 (B)	Q205	E-5	TP207	C-4
		Q206	E-5	TP208	C-4
E1	C-2	Q208	F-5	TP209	E-5
E2	D-2	Q209	E-5 (B)	TP210	E-5
E3	F-3	Q210	E-5 (B)	TP211	E-2
		Q211	F-3 (B)	TP212	E-2
IC1	B-1	Q212	F-3 (B)	TP214	C-2
IC2	D-3	Q213	D-4 (B)	TP215	E-3
IC3	F-4	Q214	F-3	TP216	E-3
IC4	C-3	Q215	F-3 (B)	TP217	E-3
IC5	C-3	Q401	F-5	TP218	C-2
IC6	C-3	Q402	F-6	TP401	E-3
IC7	B-3	Q403	F-6	TP402	E-3
IC12	C-4	Q501	A-1	TP403	F-5
IC13	D-4	Q502	A-1	TP404	A-3
IC14	D-4	Q503	A-1	TP406	B-3
IC15	C-1	Q504	A-1		
IC16	C-3	Q505	A-1	X1	C-1
IC103	F-5	Q506	B-3 (B)	X2	D-3
IC201	C-1	Q507	A-3 (B)	X201	E-2
IC202	D-4	Q508	B-3 (B)		
IC203	C-5	Q509	A-3		
IC205	D-5	Q510	A-1		
IC206	E-4	Q511	D-1 (B)		
IC207	F-4	Q512	F-5 (B)		
IC209	B-3				
IC210	B-3	RV4	C-1		
IC211	B-3	RV5	C-1		
IC212	E-2	RV201	D-4		
IC213	F-5	RV202	D-4		

NOTE  
\*-A : \*-A SIDE  
\*-(B) : \*-B SIDE

A Side

SS-46P -A SIDE-  
1-640-272-14  
PVV-1P

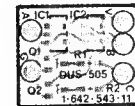
B Side



SS-46P (1/3)

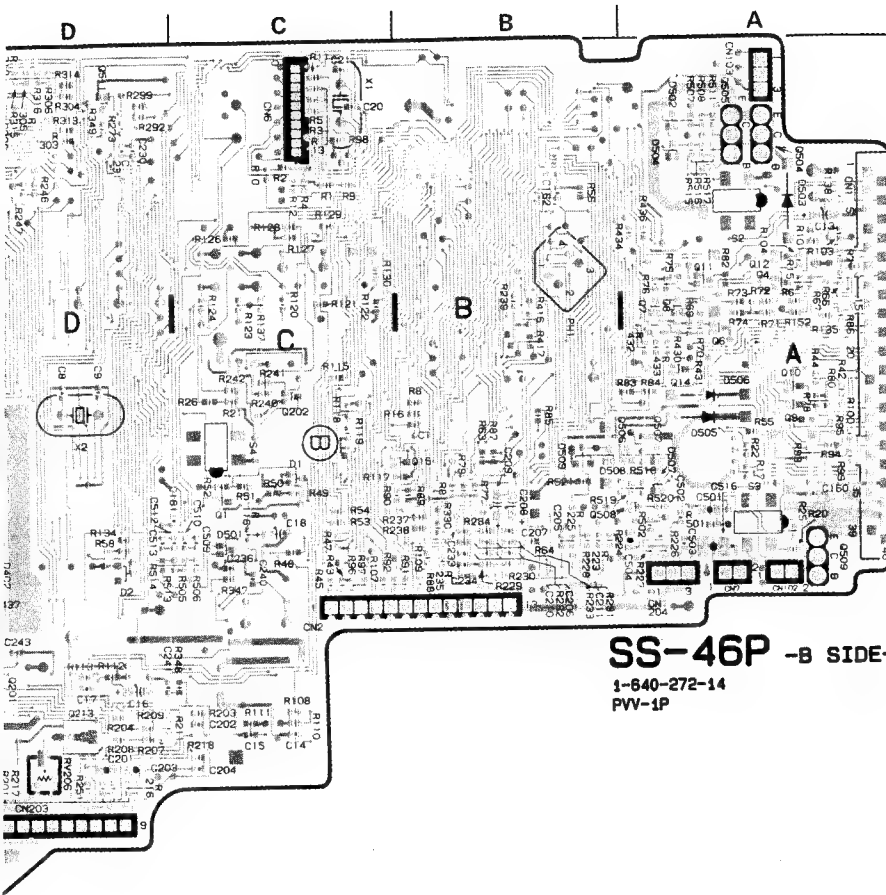
DUS-505 BOARD

B Side



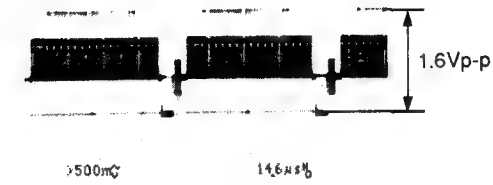
DUS-505

-B SIDE-  
1-642-543-11  
PVV-1P



SS-46P -B SIDE-  
1-640-272-14  
PVV-1P

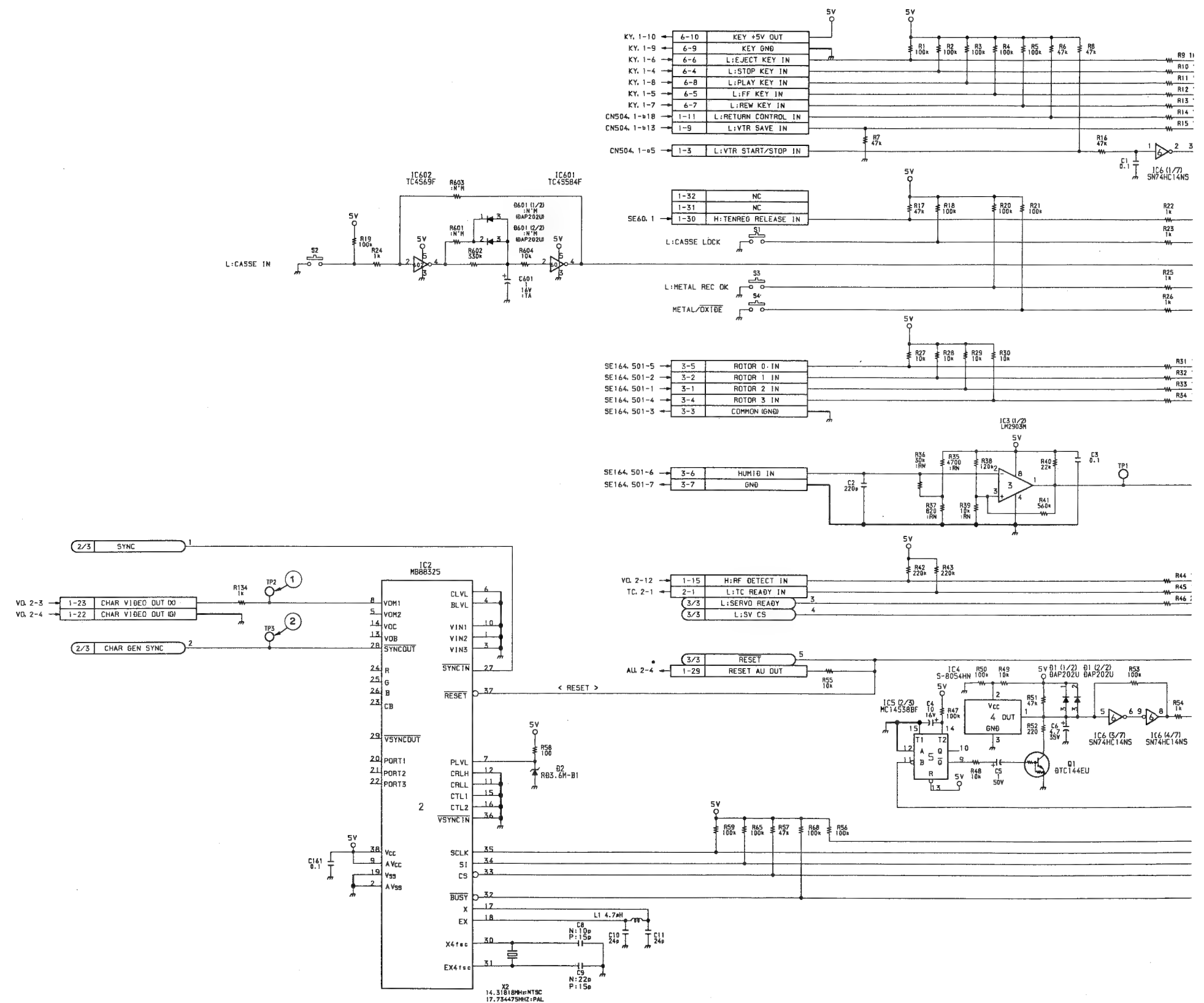
① ■ TP2 CHAR VIDEO DIAG mode

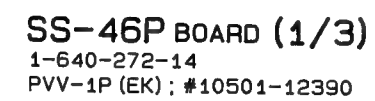


② ■ TP3 CHAR GEN SYNC 5.5Vp-p STANDBY mode



S/N 10501 through 12390

System Control  
Character Generator



SS-46P BOARD

Servo Control  
System Control

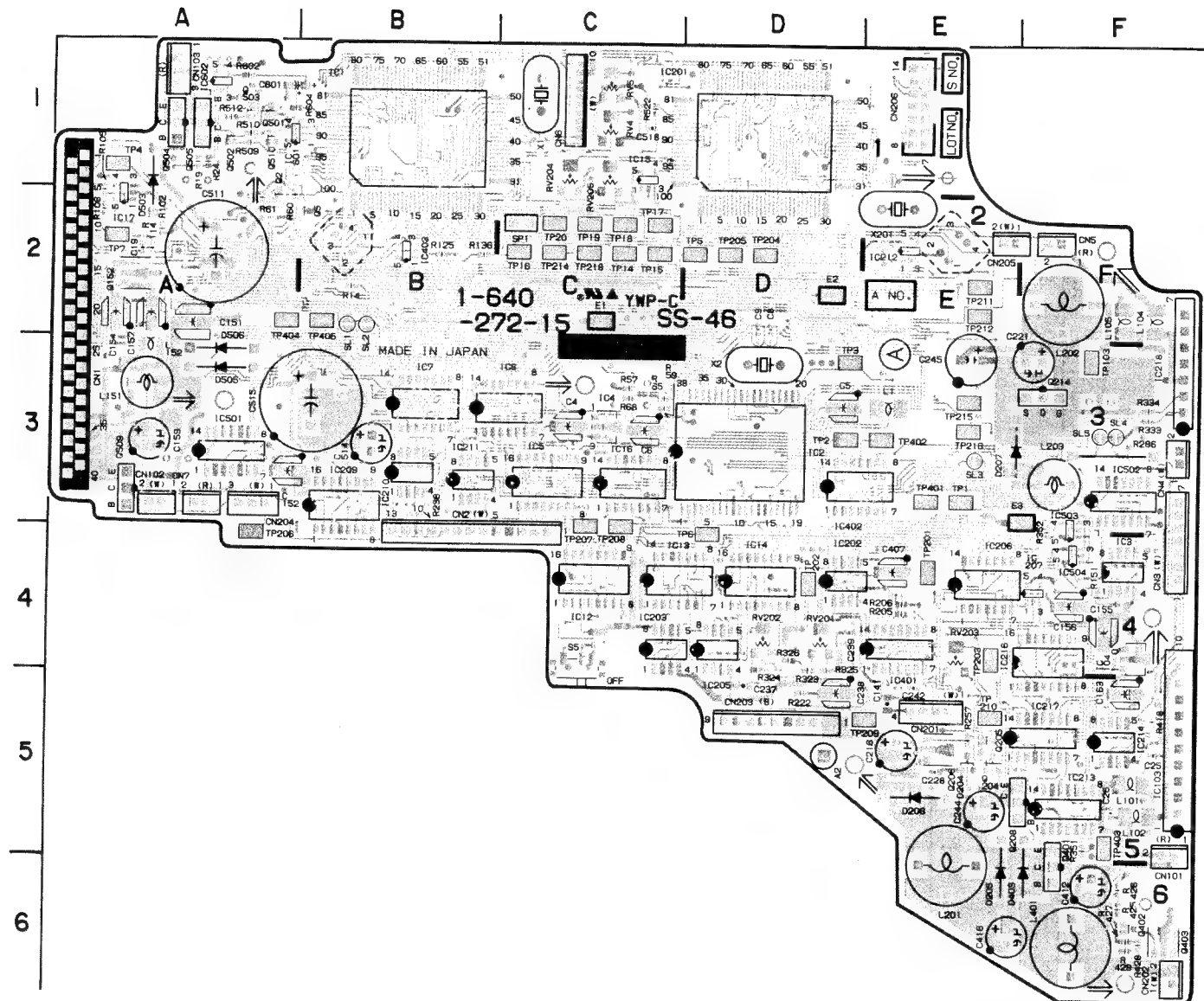
S/N 12391 and higher

SS-46P (1-640-272-15)

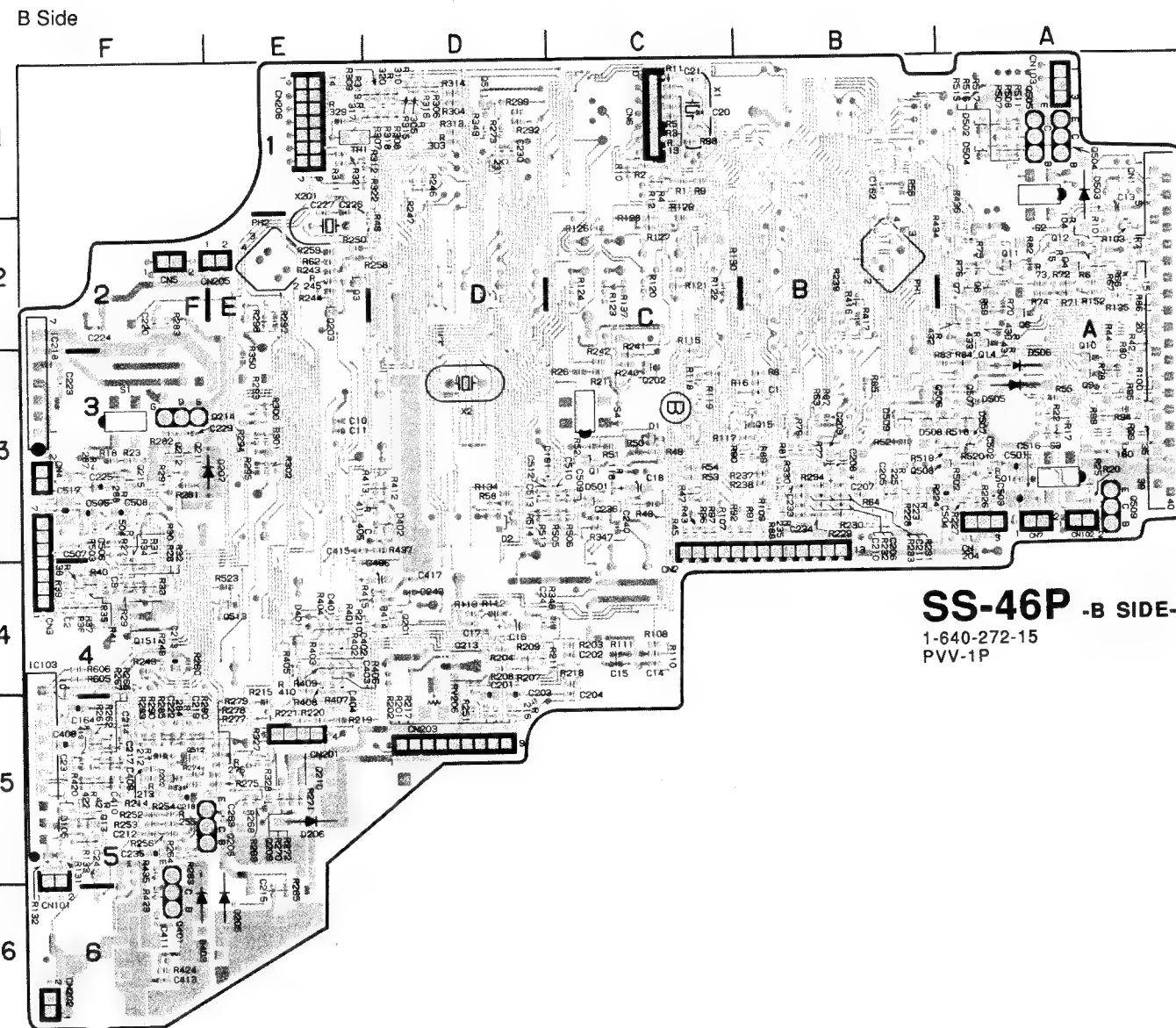
CN1	A-1 (B)	IC214	F-5	SP1	C-2
CN2	B-3	IC216	E-4	S1	F-3 (B)
CN3	F-4	IC217	F-5	S2	A-2 (B)
CN4	F-3	IC218	F-3	S3	A-3 (B)
CN5	F-2	IC401	E-5	S4	C-3 (B)
CN6	C-1	IC402	D-3	S5	C-4
CN7	A-3	IC403	B-2	TH1	E-1 (B)
CN101	F-6	IC501	A-3		
CN102	A-3	IC502	F-3		
CN103	A-1				
CN201	E-5	PH1	B-2 (B)	TP1	E-3
CN202	F-6	PH2	E-2 (B)	TP2	D-3
CN203	D-5			TP3	D-3
CN204	A-3	Q1	C-3 (B)	TP4	A-1
CN205	E-2	Q2	A-1	TP5	D-2
CN206	E-1	Q3	E-2 (B)	TP6	D-4
		Q4	A-2 (B)	TP7	A-2
D1	C-3 (B)	Q5	B-2	TP14	C-2
D2	D-3 (B)	Q6	A-2 (B)	TP15	C-2
D105	F-5 (B)	Q7	A-2 (B)	TP16	C-2
D202	F-5 (B)	Q8	A-2 (B)	TP17	C-2
D204	E-5	Q9	A-3 (B)	TP18	C-2
D205	E-6	Q10	A-3 (B)	TP19	C-2
D206	E-5	Q11	A-2 (B)	TP20	C-2
D207	E-3	Q12	A-2 (B)	TP103	F-3
D401	E-4 (B)	Q13	F-5 (B)	TP201	E-4
D402	D-3 (B)	Q14	A-3 (B)	TP202	D-4
D403	F-6	Q15	B-3 (B)	TP203	E-4
D501	C-3 (B)	Q151	F-4 (B)	TP204	D-2
D502	A-1 (B)	Q152	A-2	TP205	D-2
D503	A-2	Q201	D-4 (B)	TP206	A-4
D504	A-1 (B)	Q202	C-3 (B)	TP207	C-4
D505	A-3	Q203	E-2 (B)	TP208	C-4
D506	A-3	Q204	E-5	TP209	E-5
D507	A-3 (B)	Q205	E-5	TP210	E-5
D508	B-3 (B)	Q206	E-5	TP211	E-2
D509	B-3 (B)	Q208	F-5	TP212	E-2
		Q209	E-5 (B)	TP214	C-2
E1	C-2	Q210	E-5 (B)	TP215	E-3
E2	D-2	Q211	F-3 (B)	TP216	E-3
E3	F-3	Q212	F-3 (B)	TP218	C-2
		Q213	D-4 (B)	TP401	E-3
IC1	B-1	Q214	F-3	TP402	E-3
IC2	D-3	Q215	F-3 (B)	TP403	F-5
IC3	F-4	Q401	F-5	TP404	A-3
IC4	C-3	Q402	F-6	TP406	B-3
IC5	C-3	Q403	F-6		
IC6	C-3	Q501	A-1	X1	C-1
IC7	B-3	Q502	A-1	X2	D-3
IC12	C-4	Q503	A-1	X201	E-2
IC13	C-4	Q504	A-1		
IC14	D-4	Q505	A-1		
IC15	C-1	Q506	A-3 (B)		
IC16	C-3	Q507	A-3 (B)		
IC103	F-5	Q508	B-3 (B)		
IC201	C-1	Q509	A-3		
IC202	D-4	Q510	A-1		
IC203	C-4				
IC205	D-5	RV4	C-1		
IC206	E-4	RV5	C-1		
IC207	F-4	RV201	D-4		
IC209	B-3	RV202	D-4		
IC210	B-3	RV203	E-4		
IC211	B-3	RV204	C-1		
IC212	E-2	RV205	C-2		
IC213	F-5	RV206	D-5 (B)		

NOTE  
\* : A SIDE  
\* (B) : B SIDE

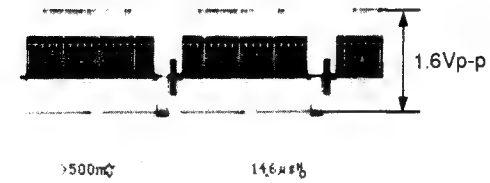
A Side



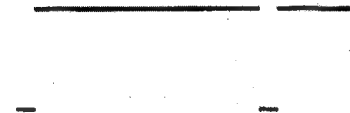
SS-46P (1/3)



■ TP2 CHAR VIDEO DIAG mode



■ TP3 CHAR GEN SYNC 5.5Vp-p STANDBY mode

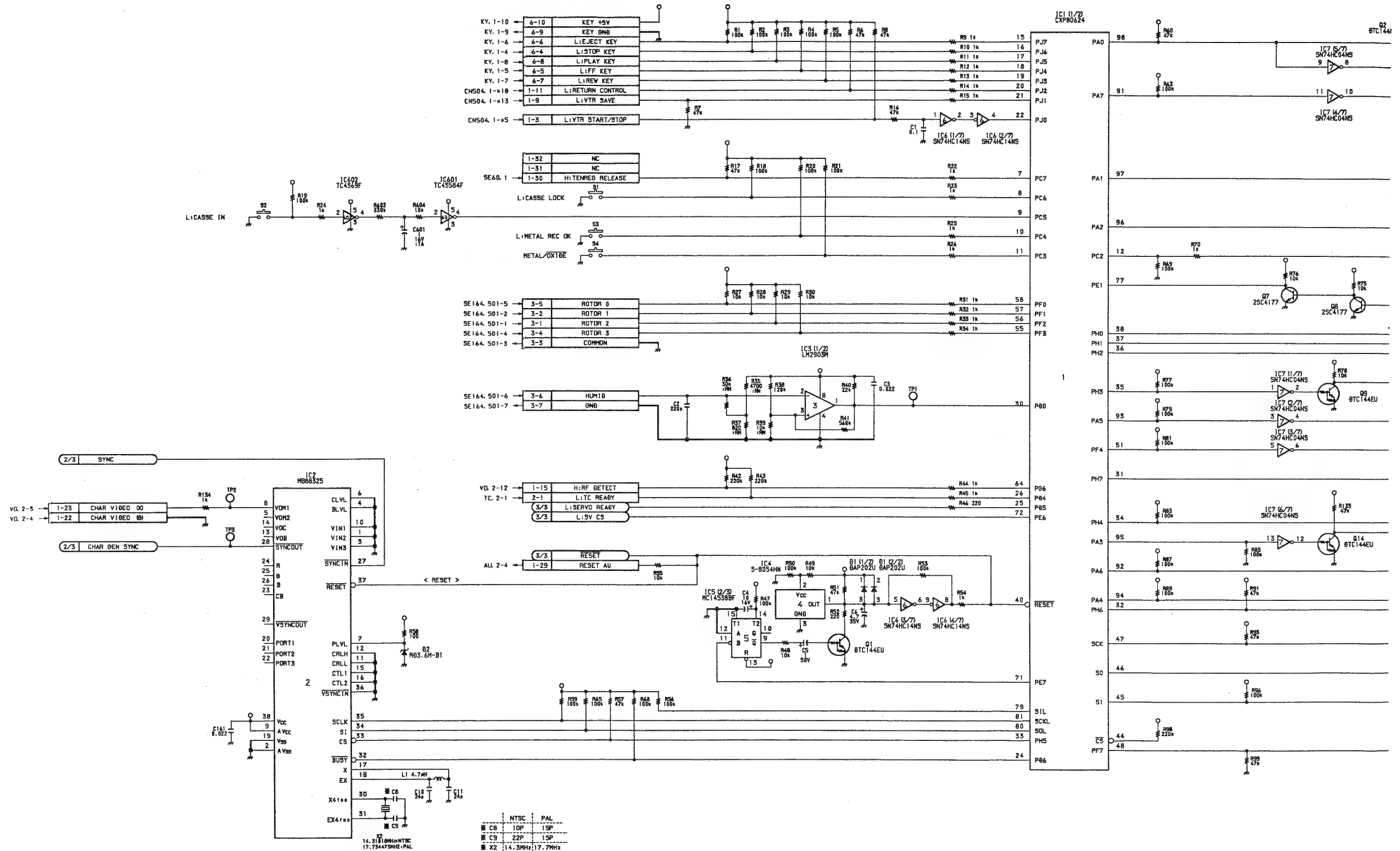


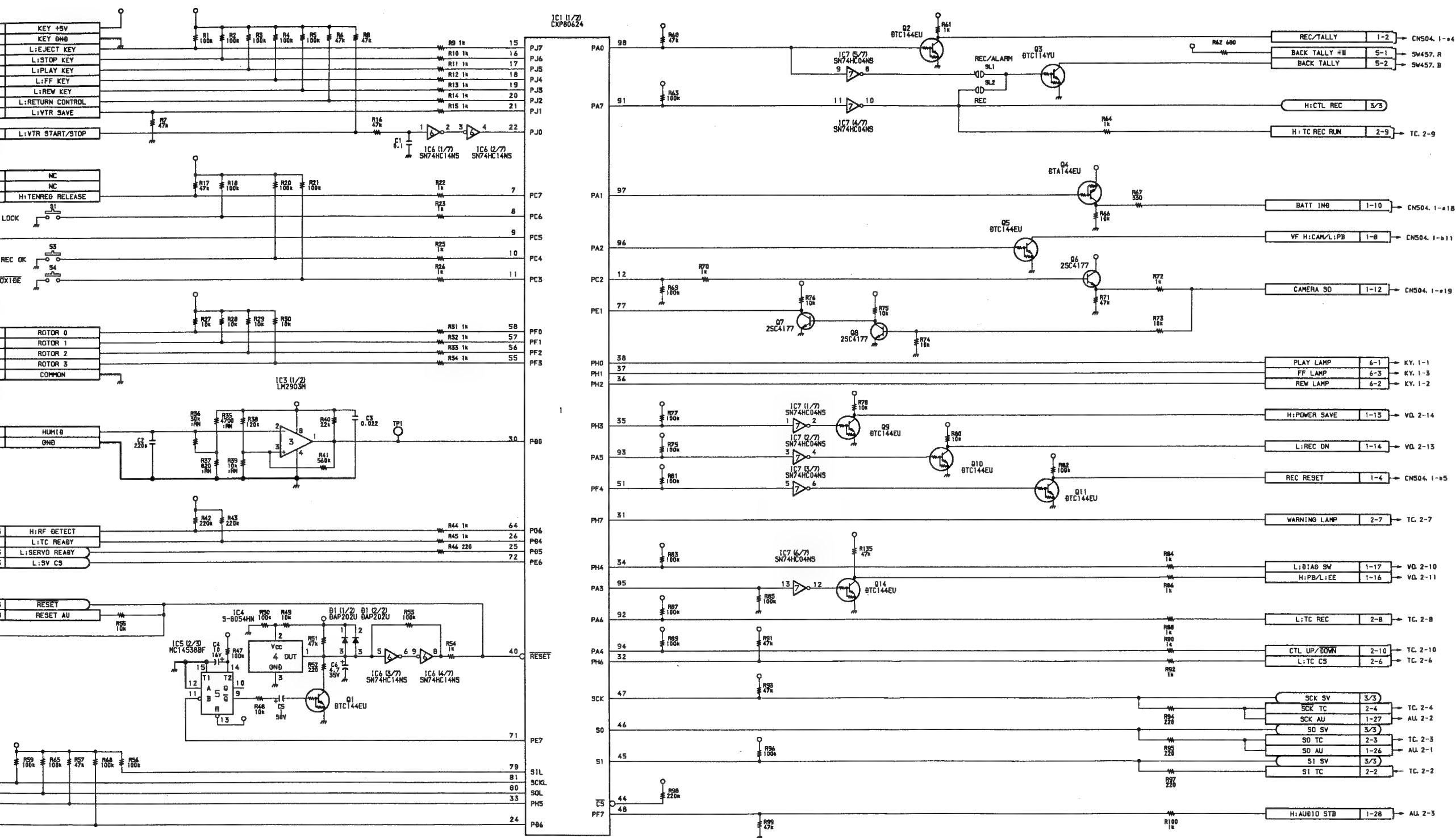


SS-46P BOARD (1/3)

System Control  
Character Generator

S/N 12391 and higher

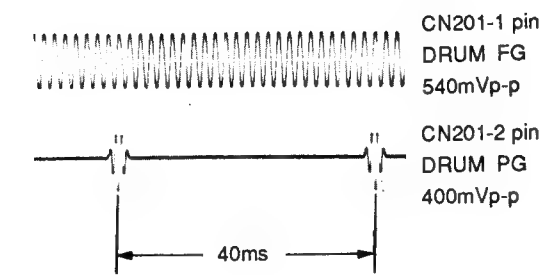




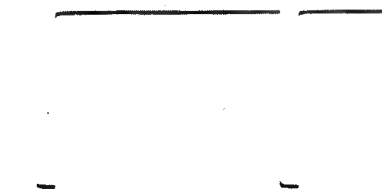
- \* A0 22-254 100k (1-764-318-15)
- \* A1 22-254 100k (1-764-318-15)
- \* A2 22-254 100k (1-764-318-15)
- \* A3 22-254 100k (1-764-318-15)
- \* A4 22-254 100k (1-764-318-15)
- \* A11 22-254 100k (1-764-318-15)

**SS-46P BOARD (1/3)**  
1-640-272-15  
PVV-1P (UK) ; #12391-

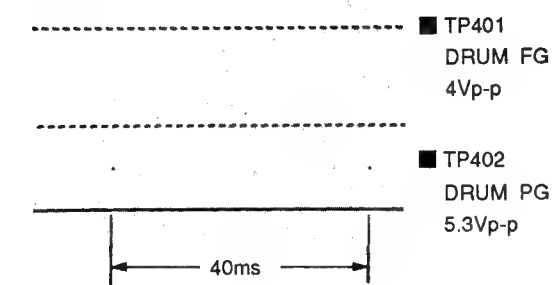
① REC mode



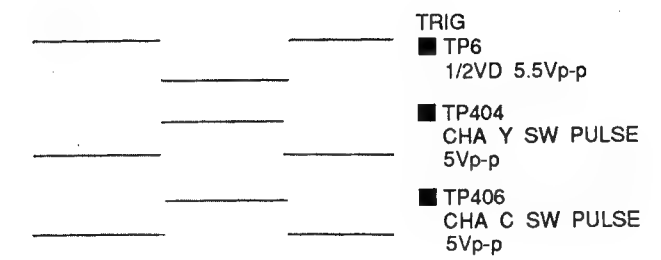
⑤ ■ TP5 REF SYNC 5Vp-p REC mode



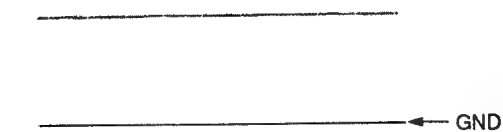
② REC mode



⑥ REC mode



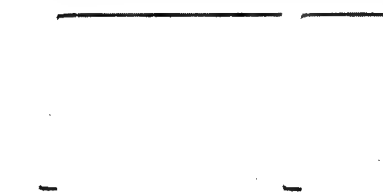
③ ■ TP403 DRUM DRIVE 6.0Vdc REC mode



⑦ IC213-5,7,9 PWM SAW 1.5Vp-p



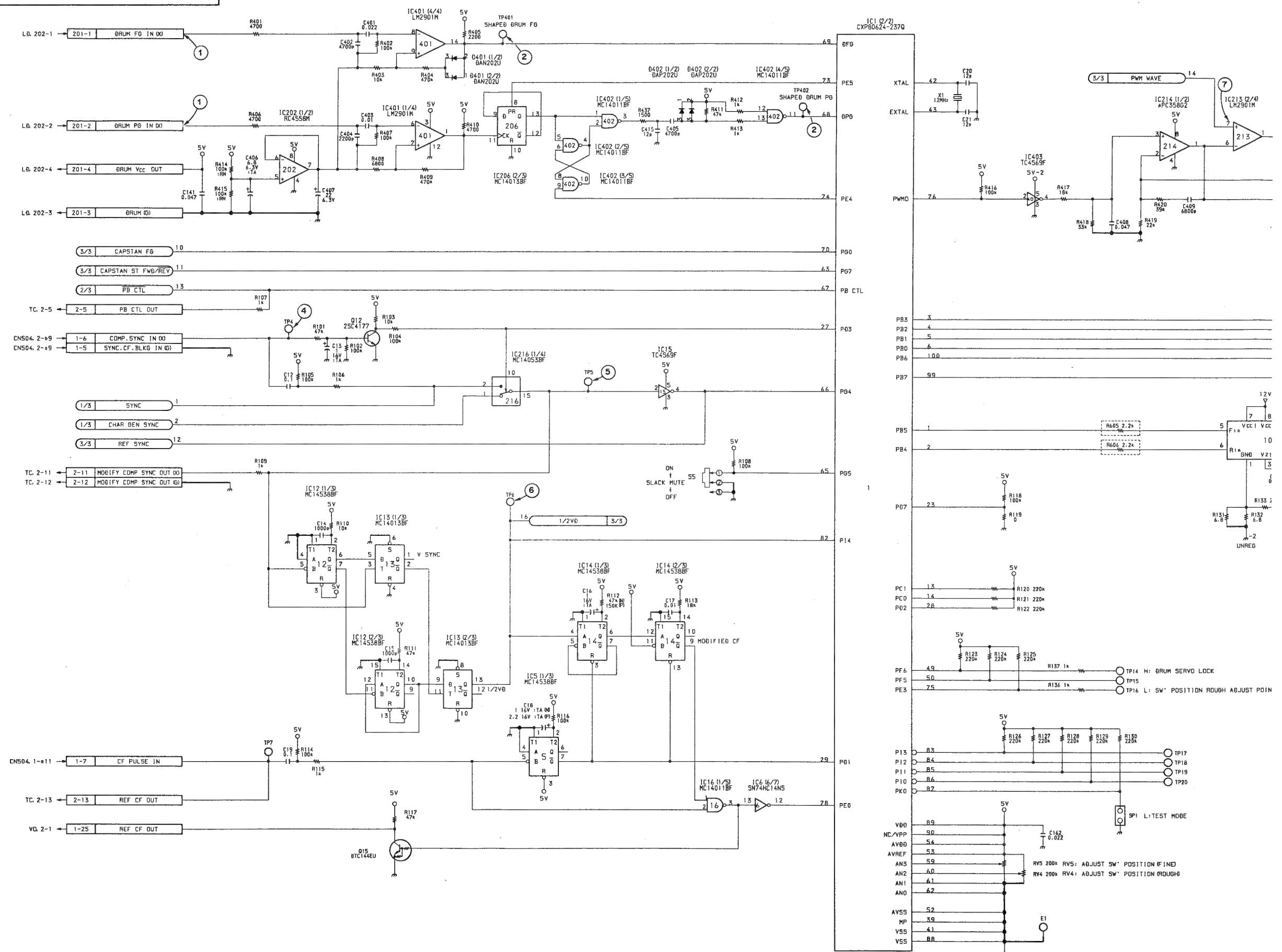
④ ■ TP4 COMP SYNC 5Vp-p REC mode



**SS-46P BOARD (2/3)**  
Drum Servo System  
System Control

S/N 10001 through 10100

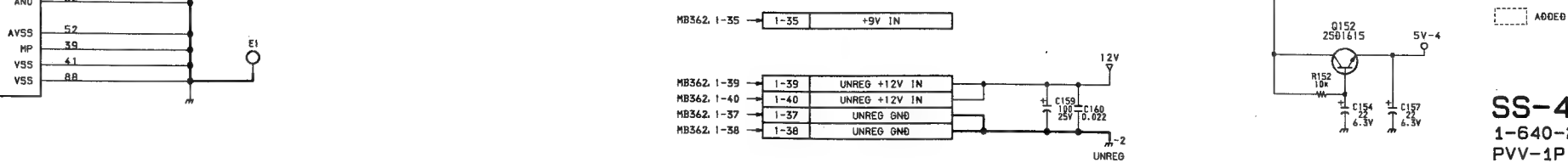
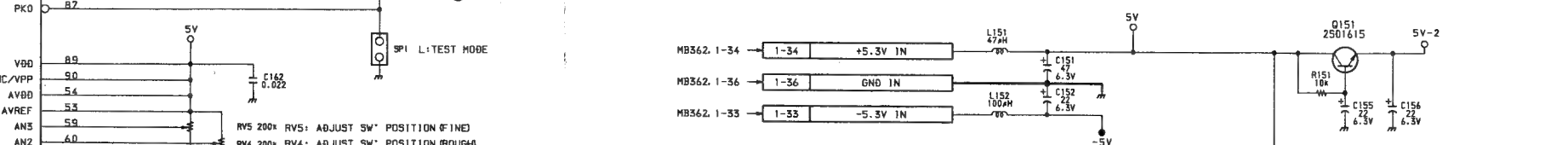
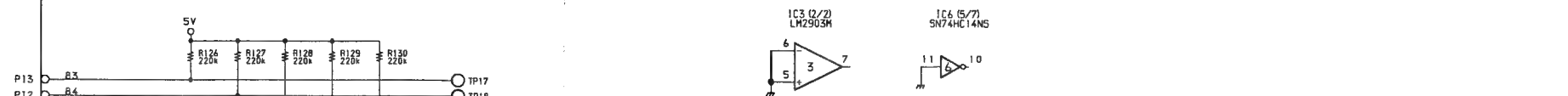
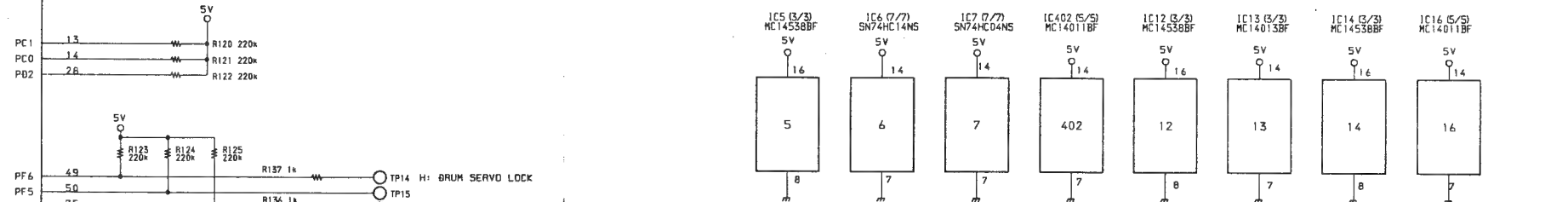
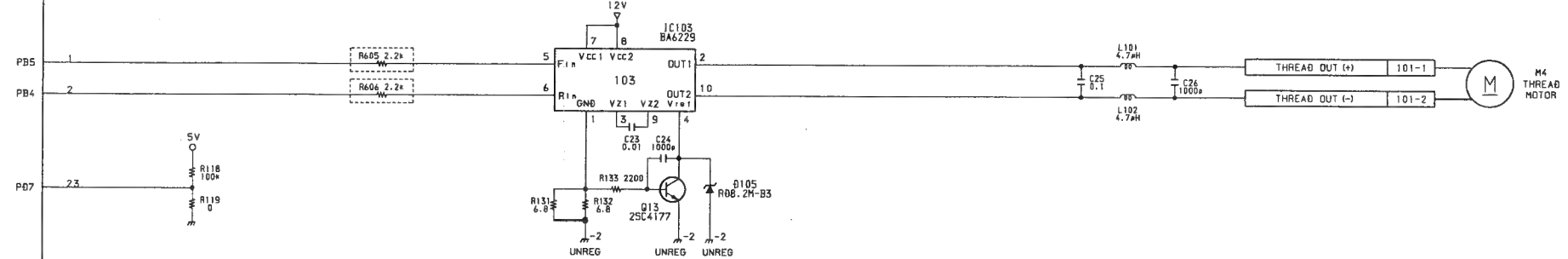
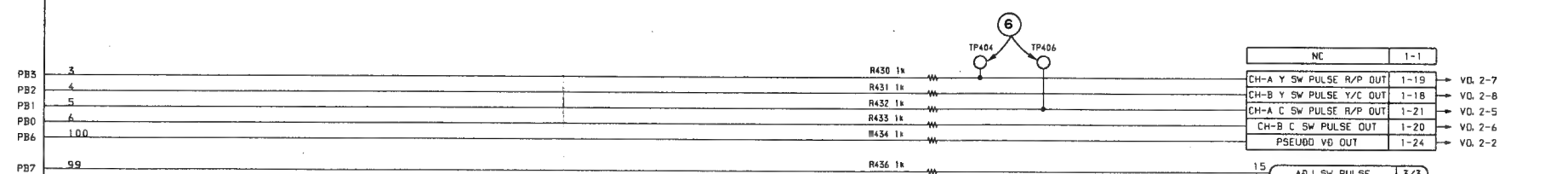
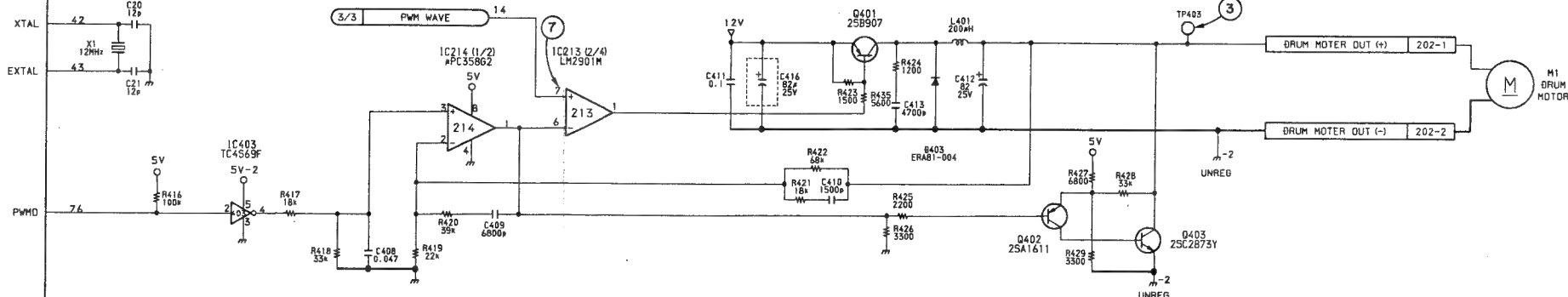
SS-46P (2/3) SS-46P (2/3)



11-27 (a)

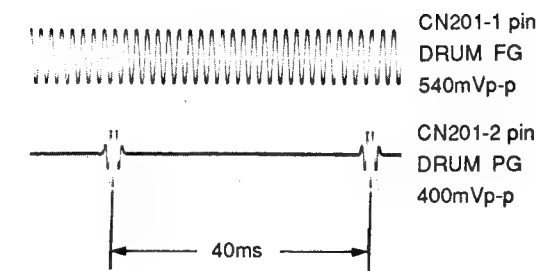
11-27 (a)

A | B | C | D | E | F | G | H



SS-46P BOARD (2/3)  
1-640-272-11  
PVV-1P (EK) ; #10001-10100

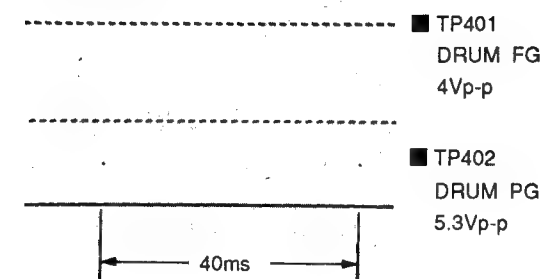
① REC mode



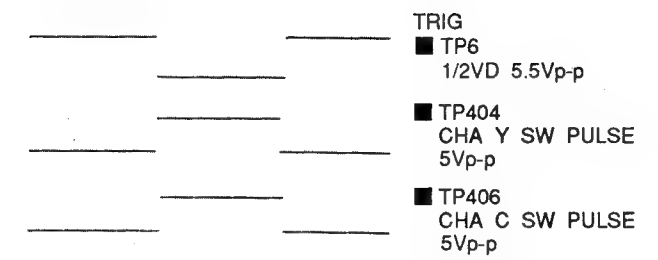
⑤ ■ TP5 REF SYNC 5Vp-p REC mode



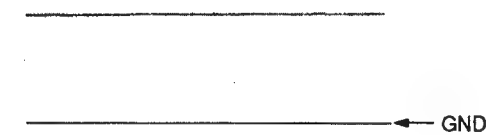
② REC mode



⑥ REC mode



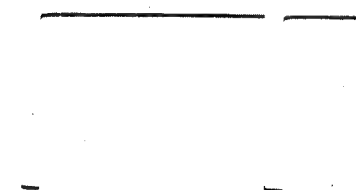
③ ■ TP403 DRUM DRIVE 6.0Vdc REC mode

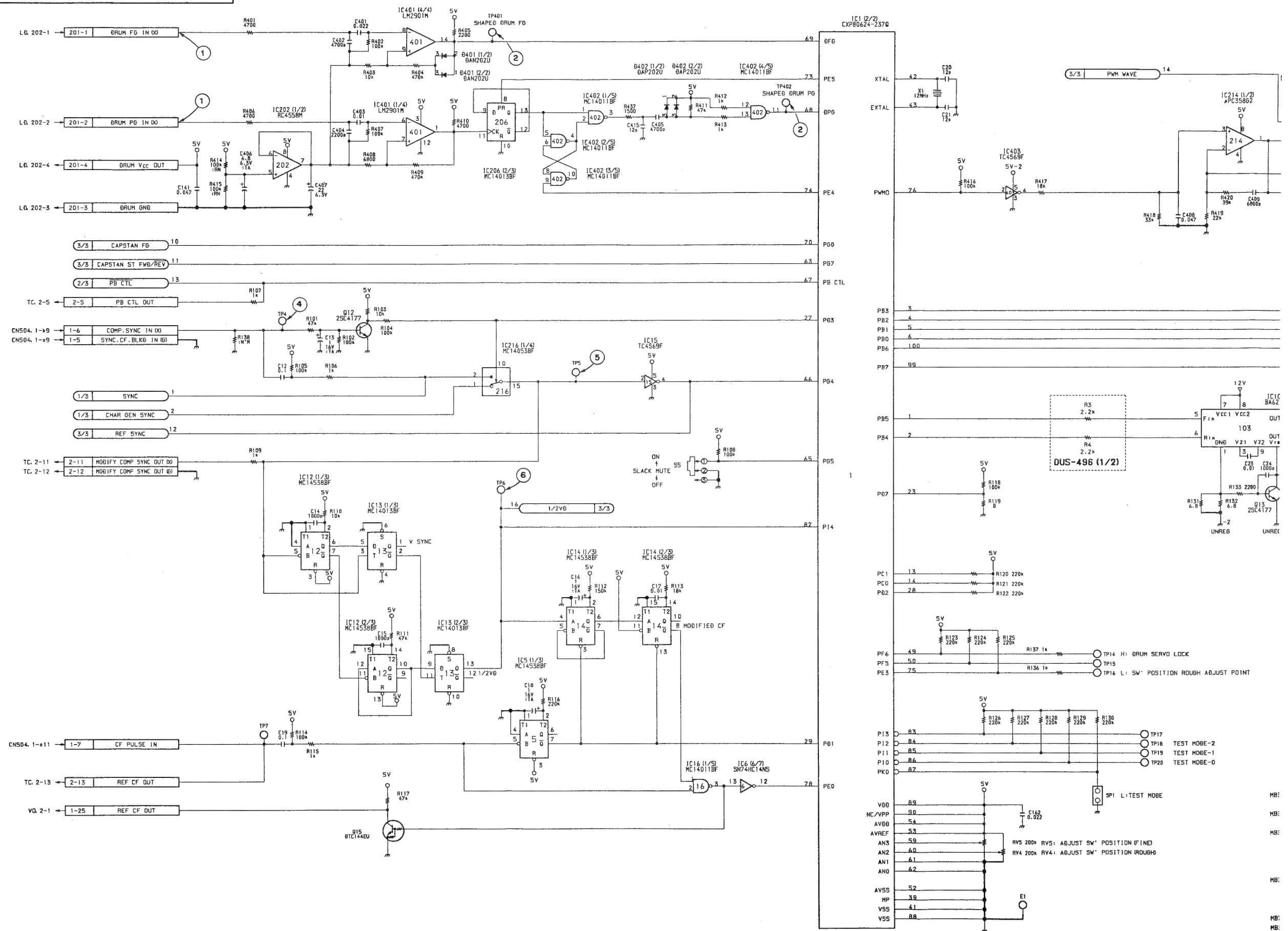


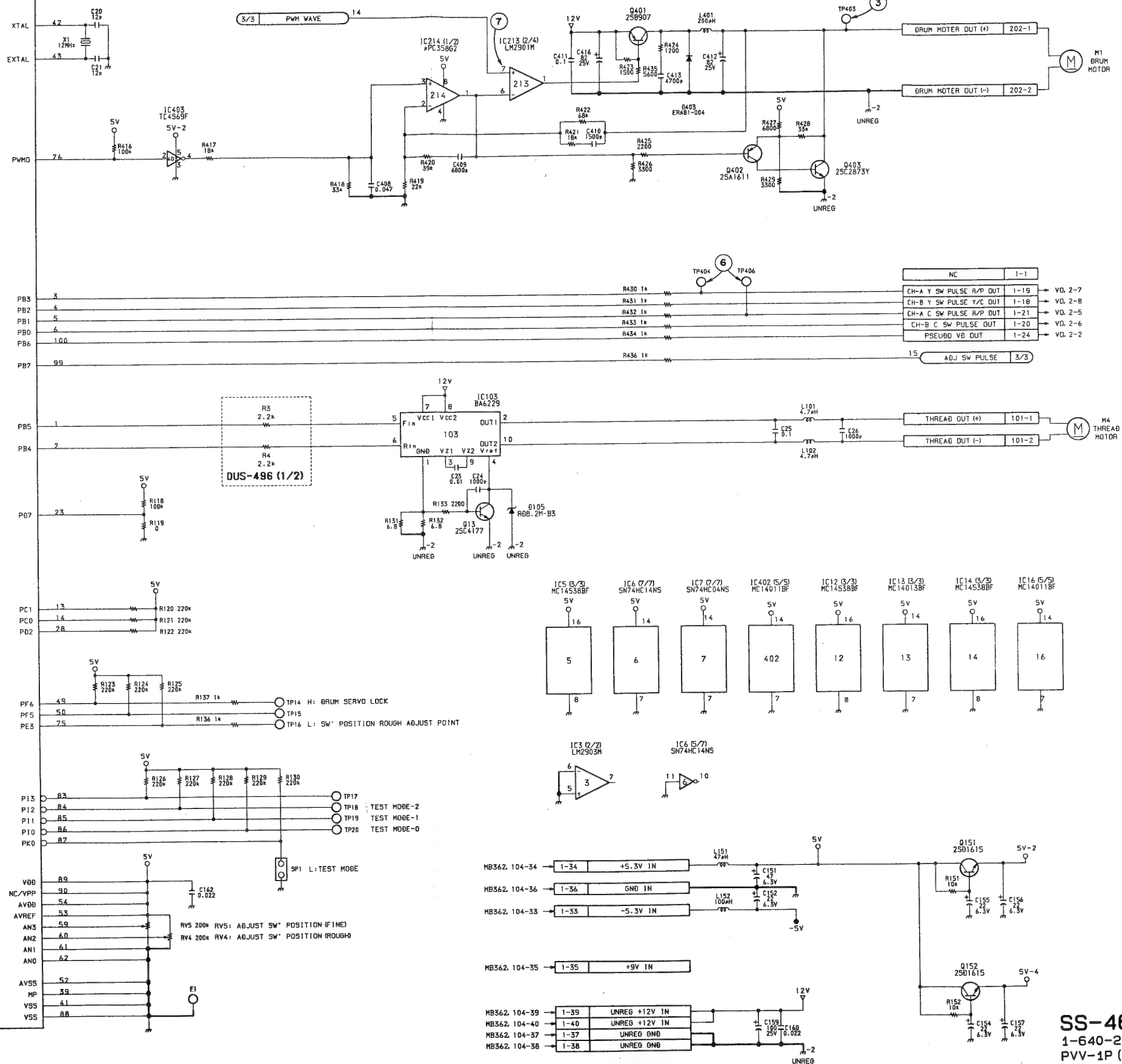
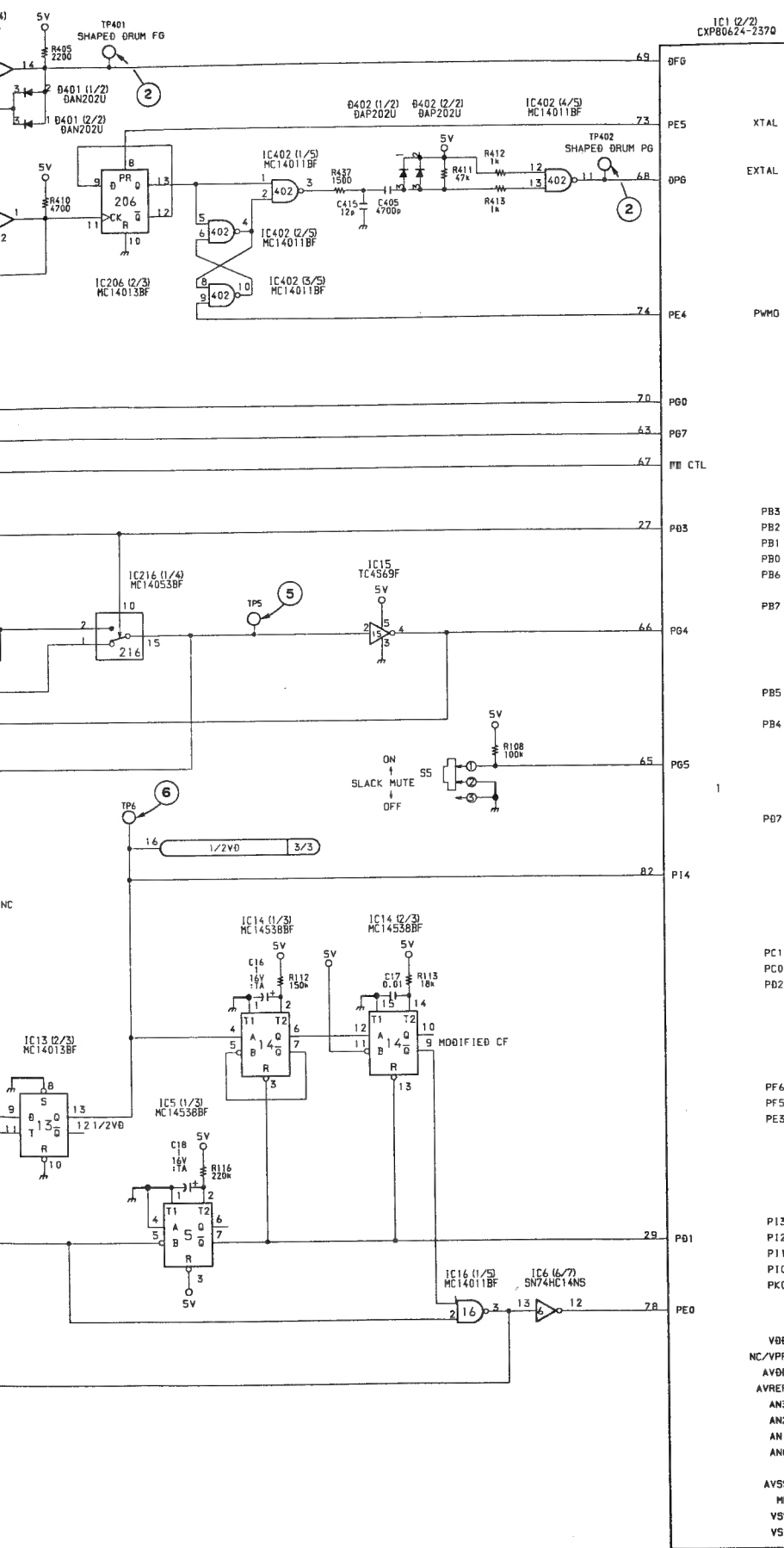
⑦ IC213-5,7,9 PWM SAW 1.5Vp-p



④ ■ TP4 COMP SYNC 5Vp-p REC mode



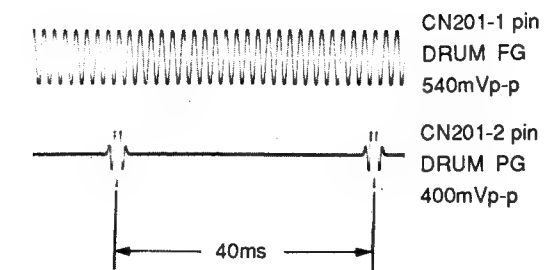




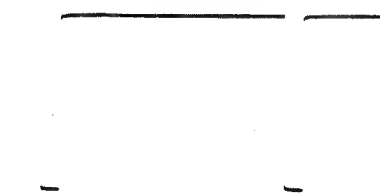
SS-46P BOARD (2/3)  
1-640-272-12  
PVV-1P (EK) : #10101-10500



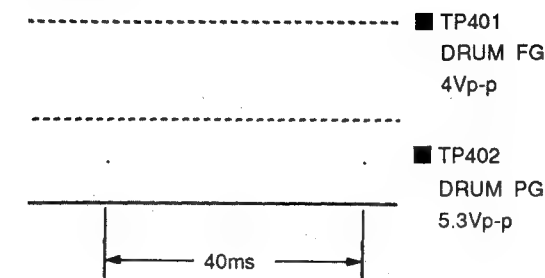
① REC mode



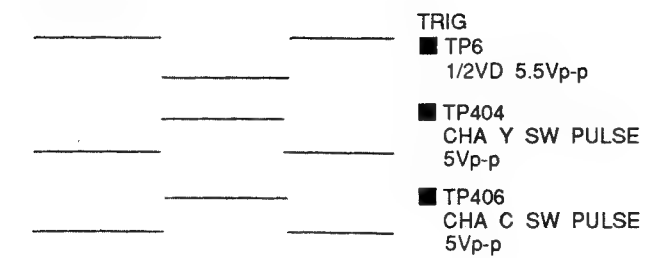
⑤ ■ TP5 REF SYNC 5Vp-p REC mode



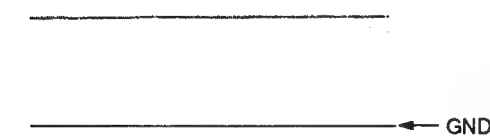
② REC mode



⑥ REC mode



③ ■ TP403 DRUM DRIVE 6.0Vdc REC mode



⑦ IC213-5,7,9 PWM SAW 1.5Vp-p



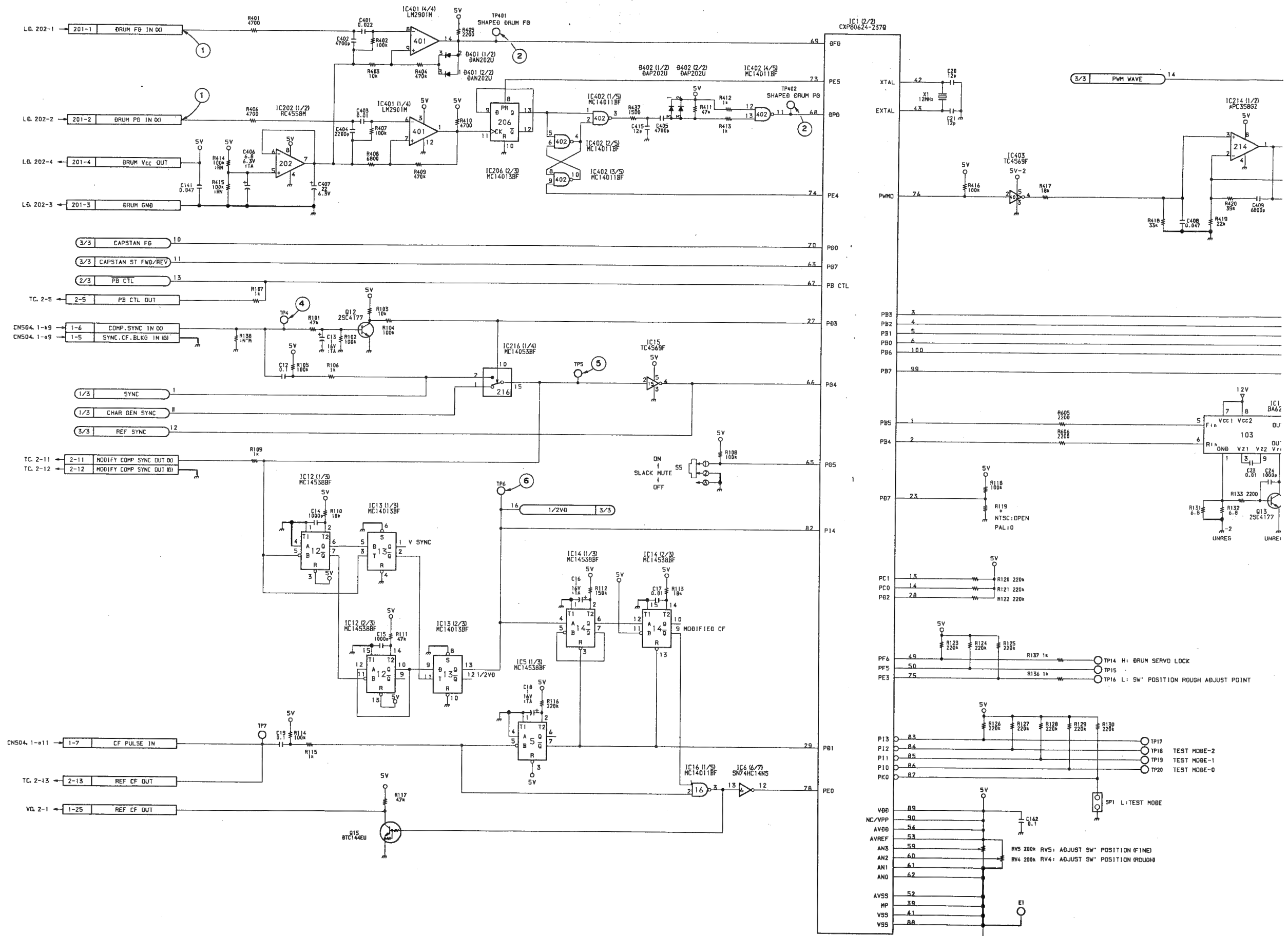
④ ■ TP4 COMP SYNC 5Vp-p REC mode



**SS-46P BOARD (2/3)**  
Drum Servo System  
System Control

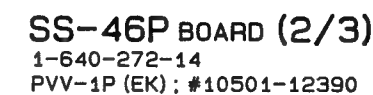
S/N 10501 through 12390

SS-46P (2/3) SS-46P (2/3)



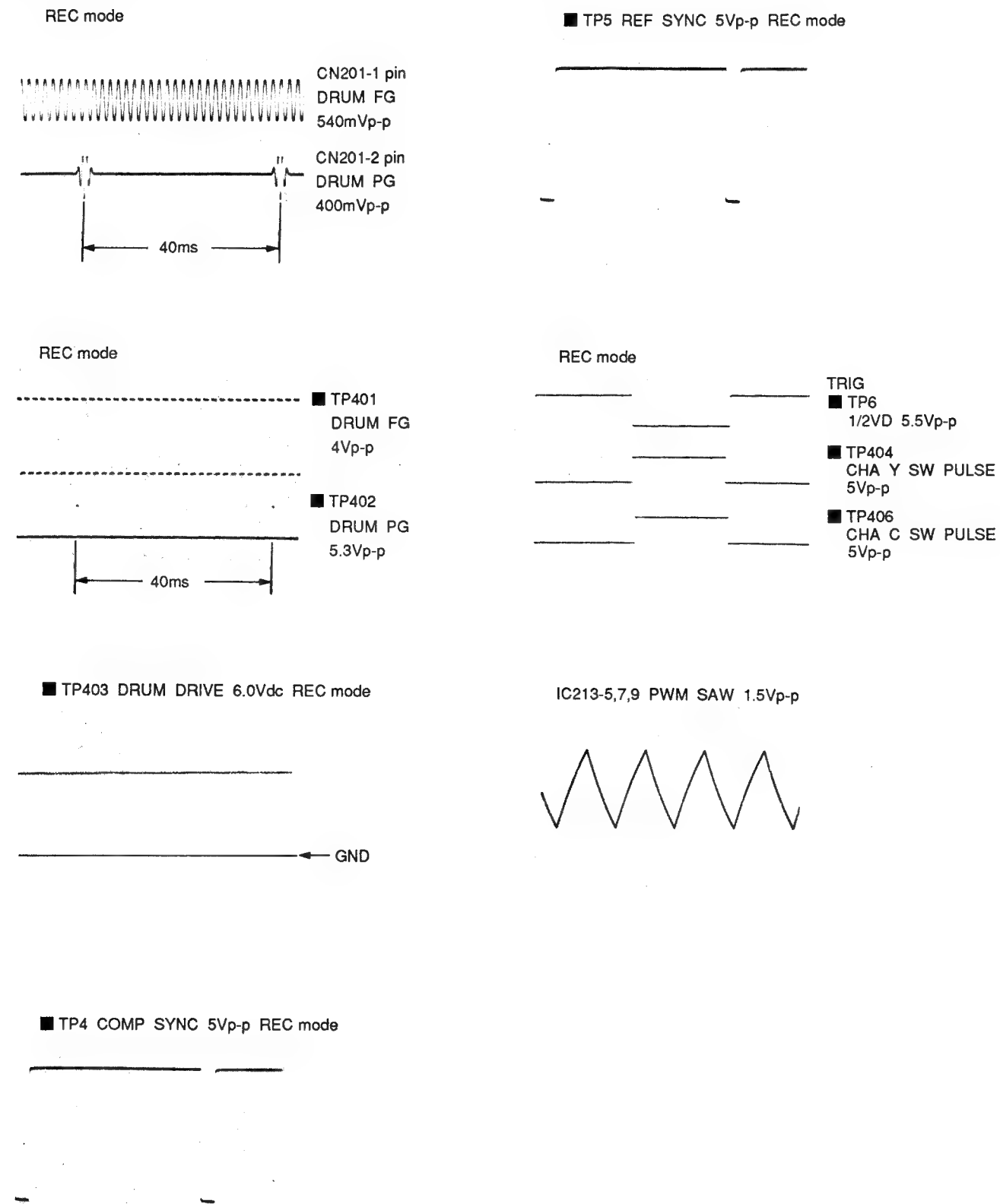
11-27 (c)

11-27 (c)



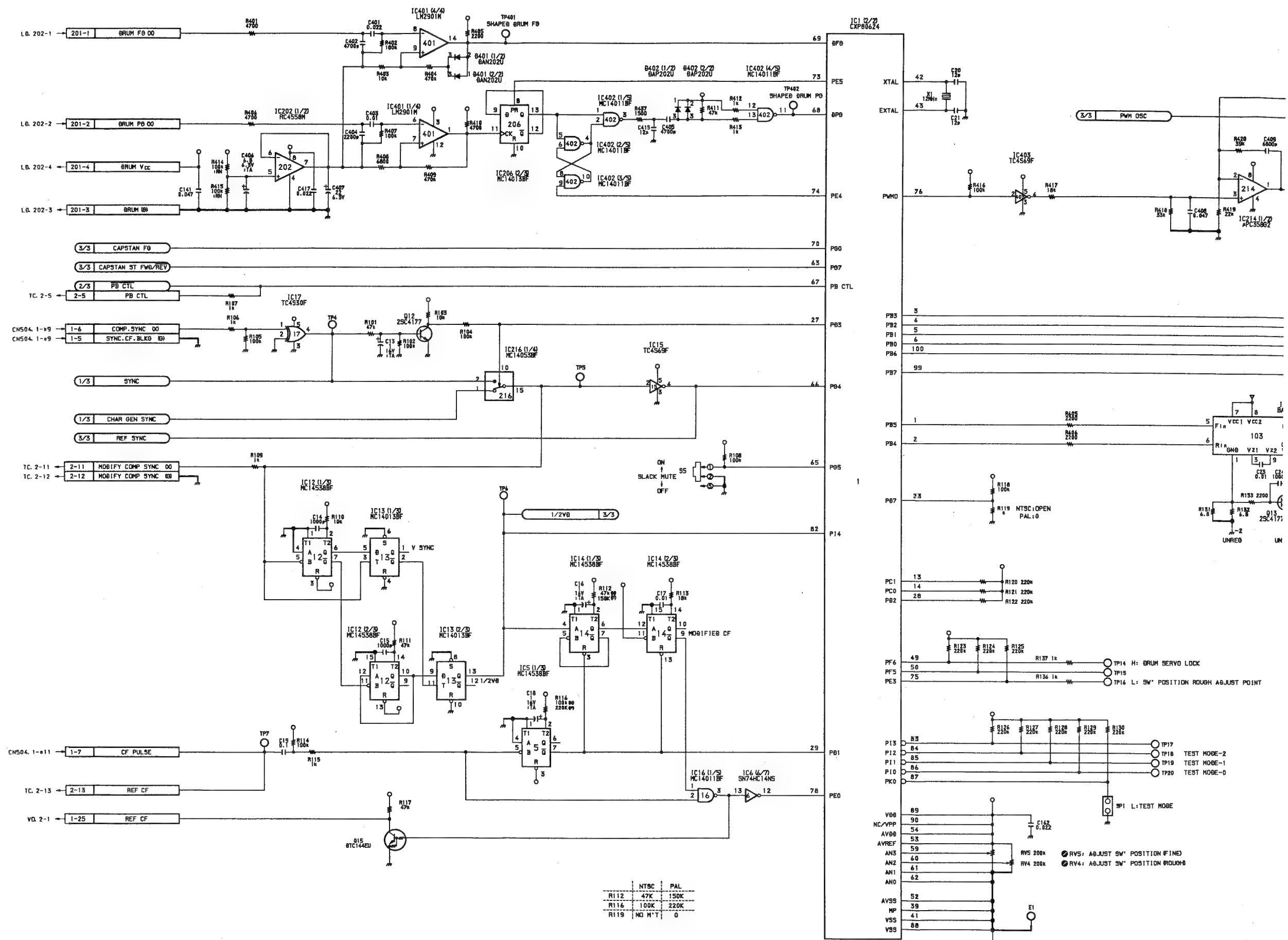
SS-46P (2/3)

S/N 12391 and higher

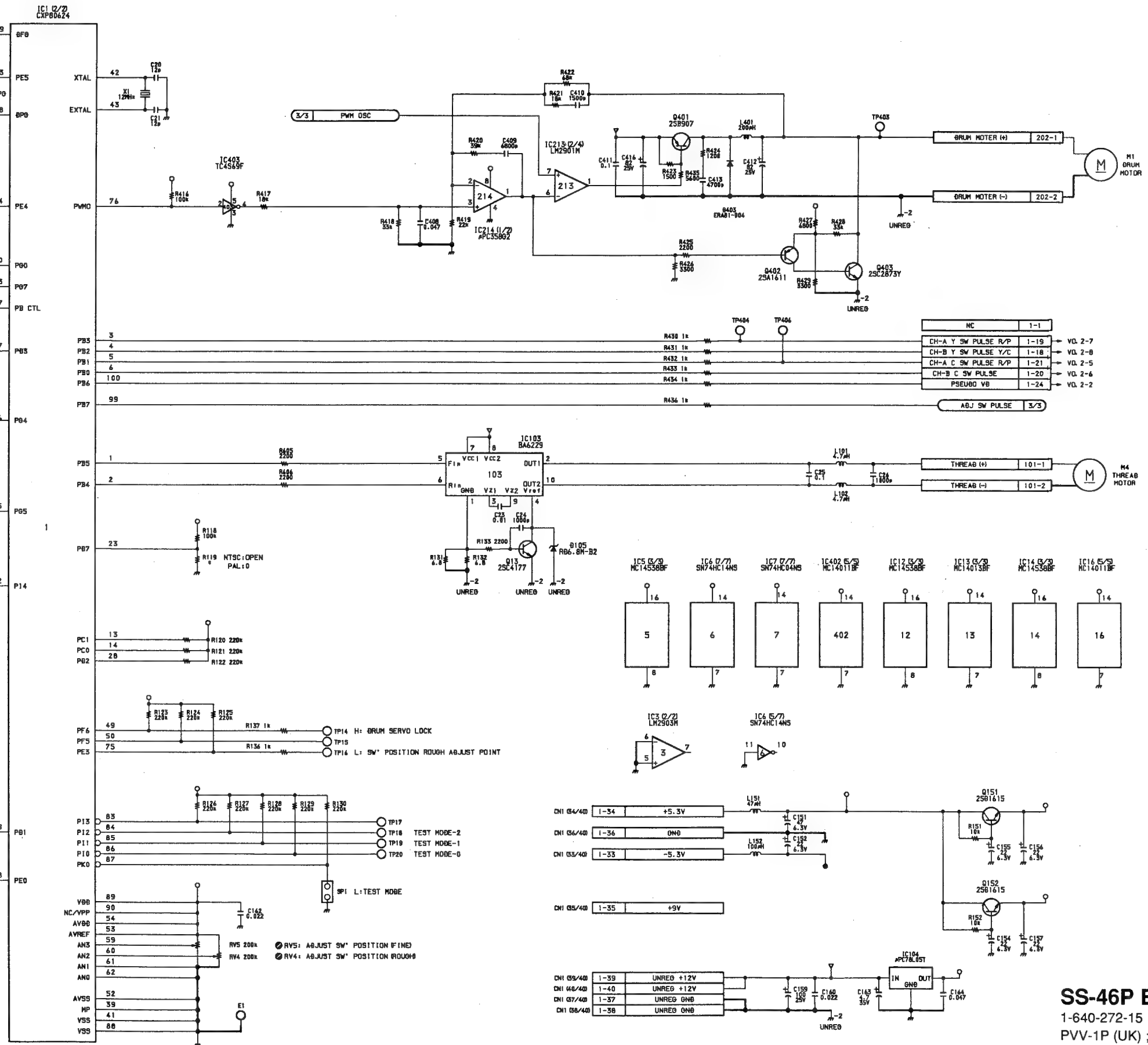
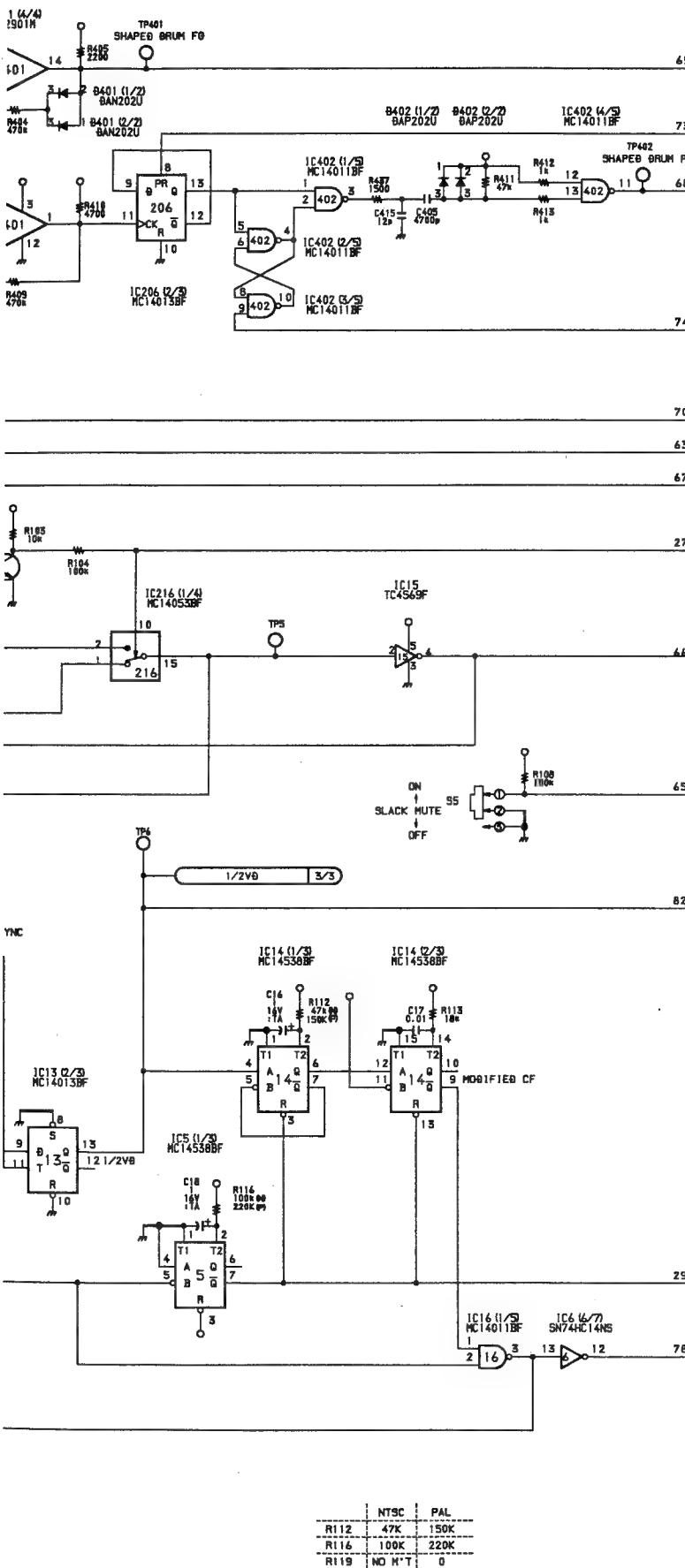


System Control  
Character Generator

SS-46P (2/3) SS-46P (2/3)



H

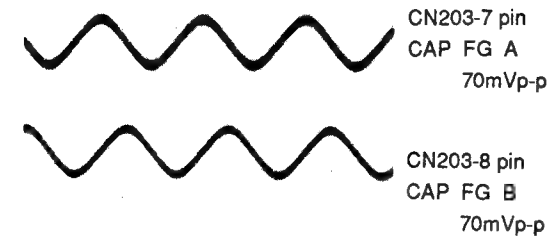


**SS-46P BOARD (2/3)**  
1-640-272-15  
PVV-1P (UK) ; #12391-

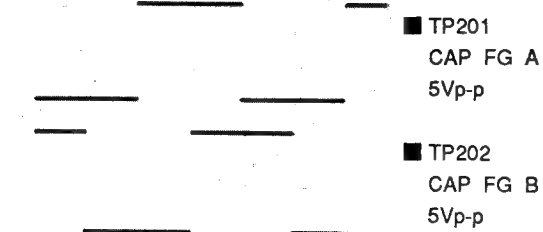
SS-46P (3/3)

S/N 10001 through 10100

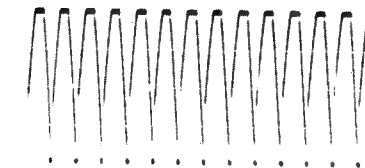
① REC mode



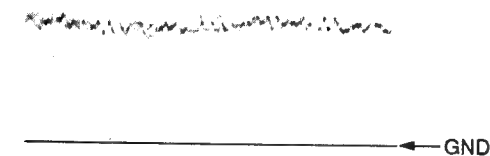
② REC mode



③ TP203 CAP STOP SERVO ERROR REC mode



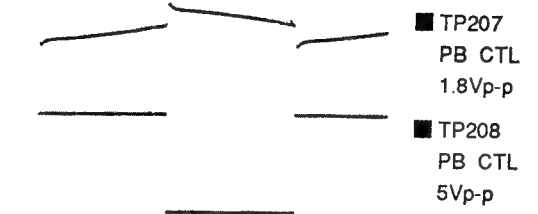
④ TP209 CAP DRIVE 3.5Vdc REC mode



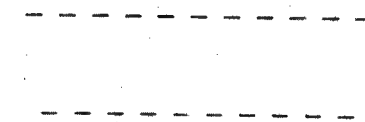
⑤ TP206 REC CTL 40mVp-p REC mode



⑥ PB mode



⑦ TP204 S REEL FG 5.3Vp-p FF/REW mode  
TP205 T REEL FG 5.3Vp-p FF/REW mode

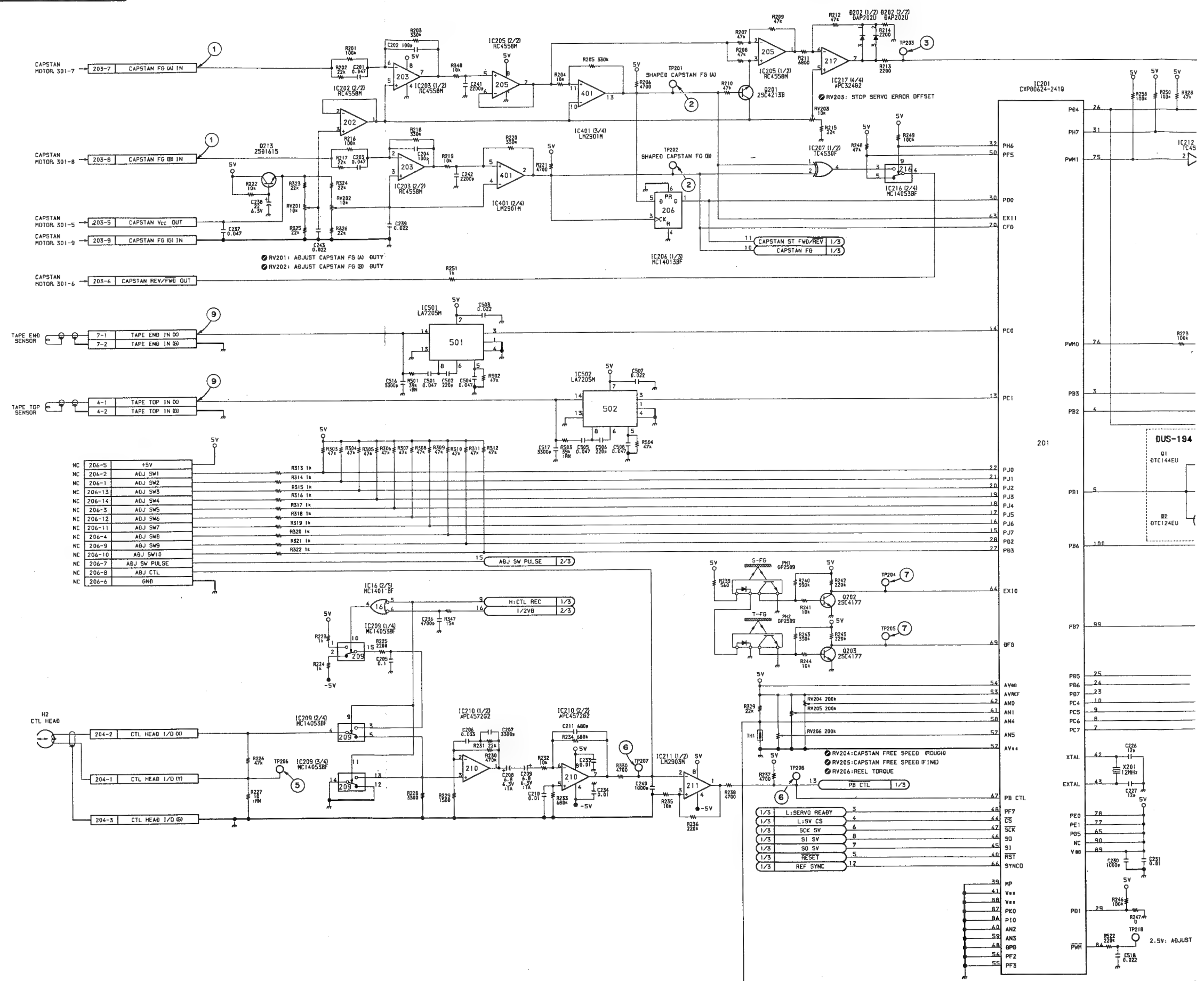


⑧ IC213-5,7,9 PWM SAW 1.5Vp-p

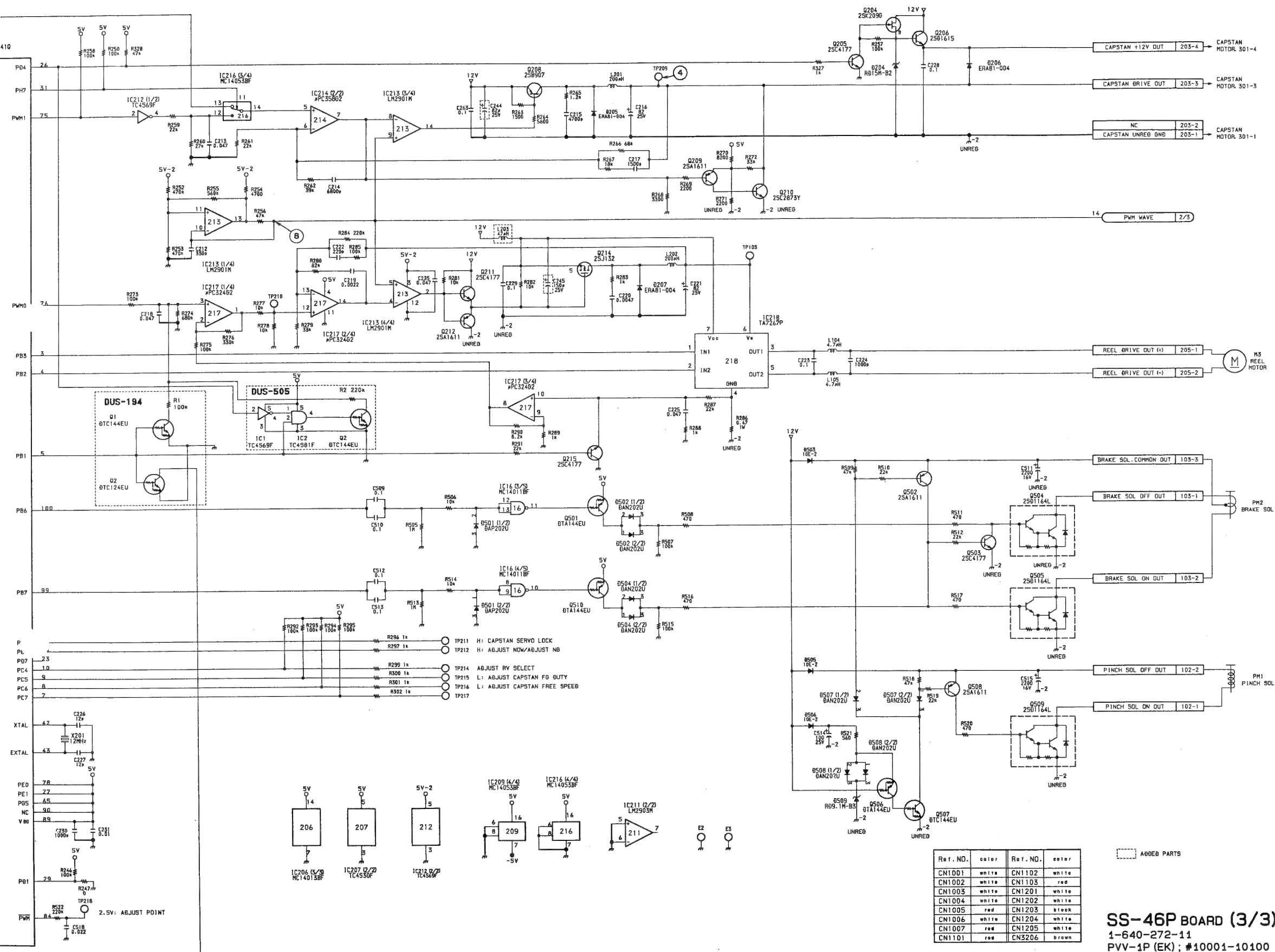


⑨ CN4-1 pin/CN7-1 pin 180mVp-p PB mode







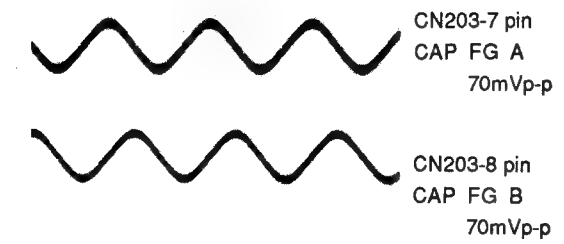


**SS-46P BOARD (3/3)**  
1-640-272-11  
PVV-1P (EK) ; #10001-10100

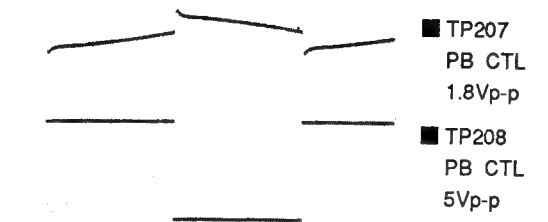
SS-46P (3/3)

S/N 10101 through 10500

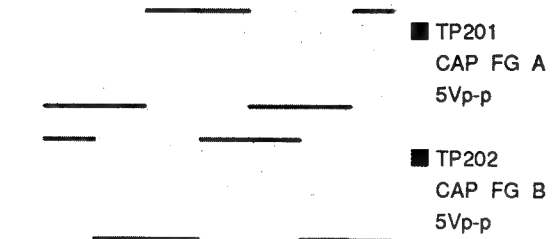
① REC mode



⑥ PB mode



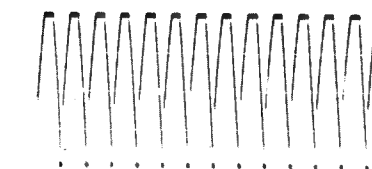
② REC mode



⑦ TP204 S REEL FG 5.3Vp-p FF/REW mode  
TP205 T REEL FG 5.3Vp-p FF/REW mode



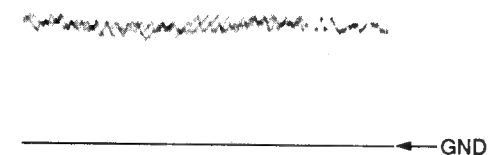
③ TP203 CAP STOP SERVO ERROR REC mode



⑧ IC213-5,7,9 PWM SAW 1.5Vp-p



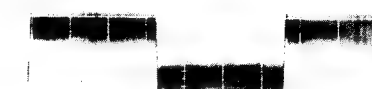
④ TP209 CAP DRIVE 3.5Vdc REC mode

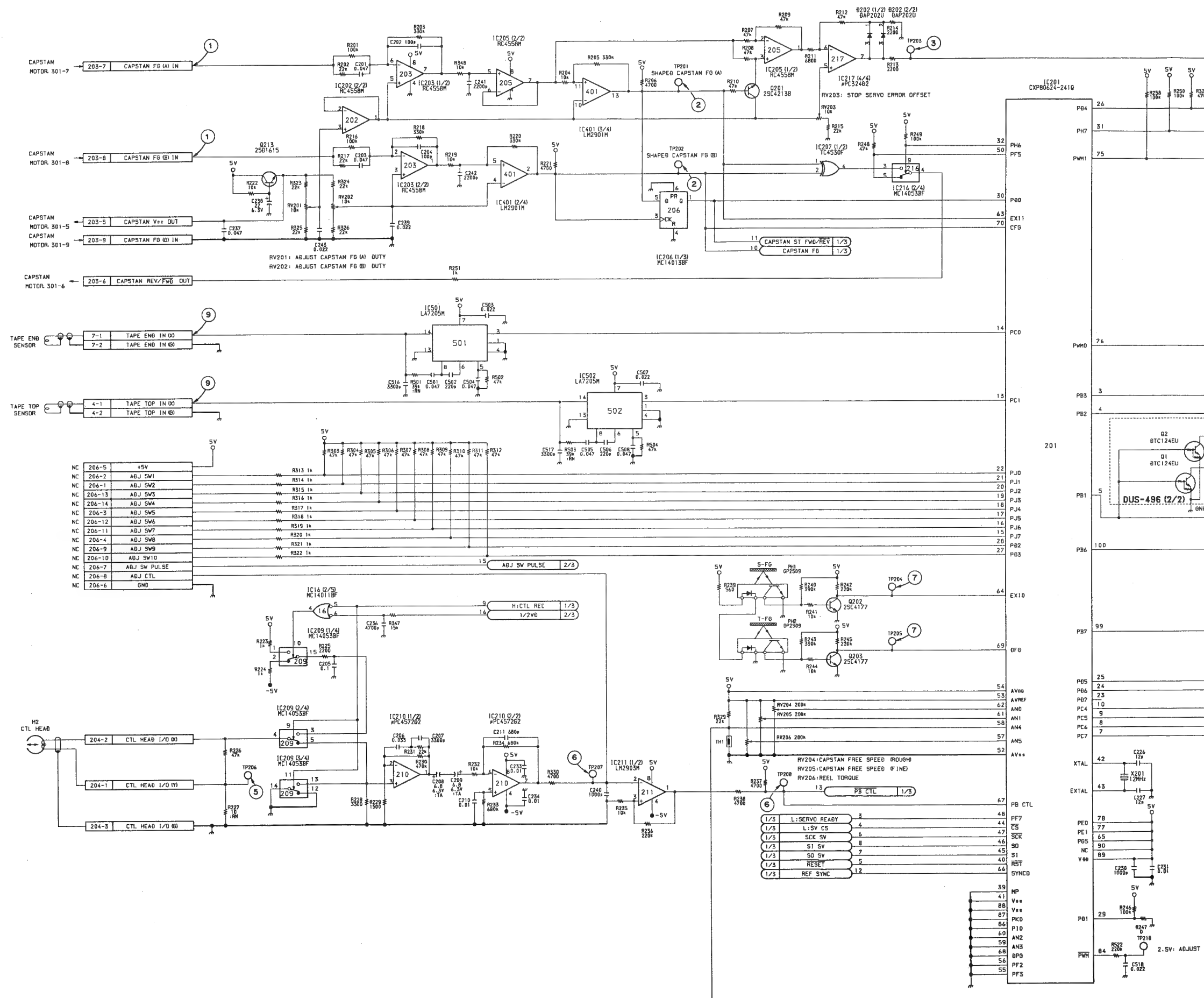


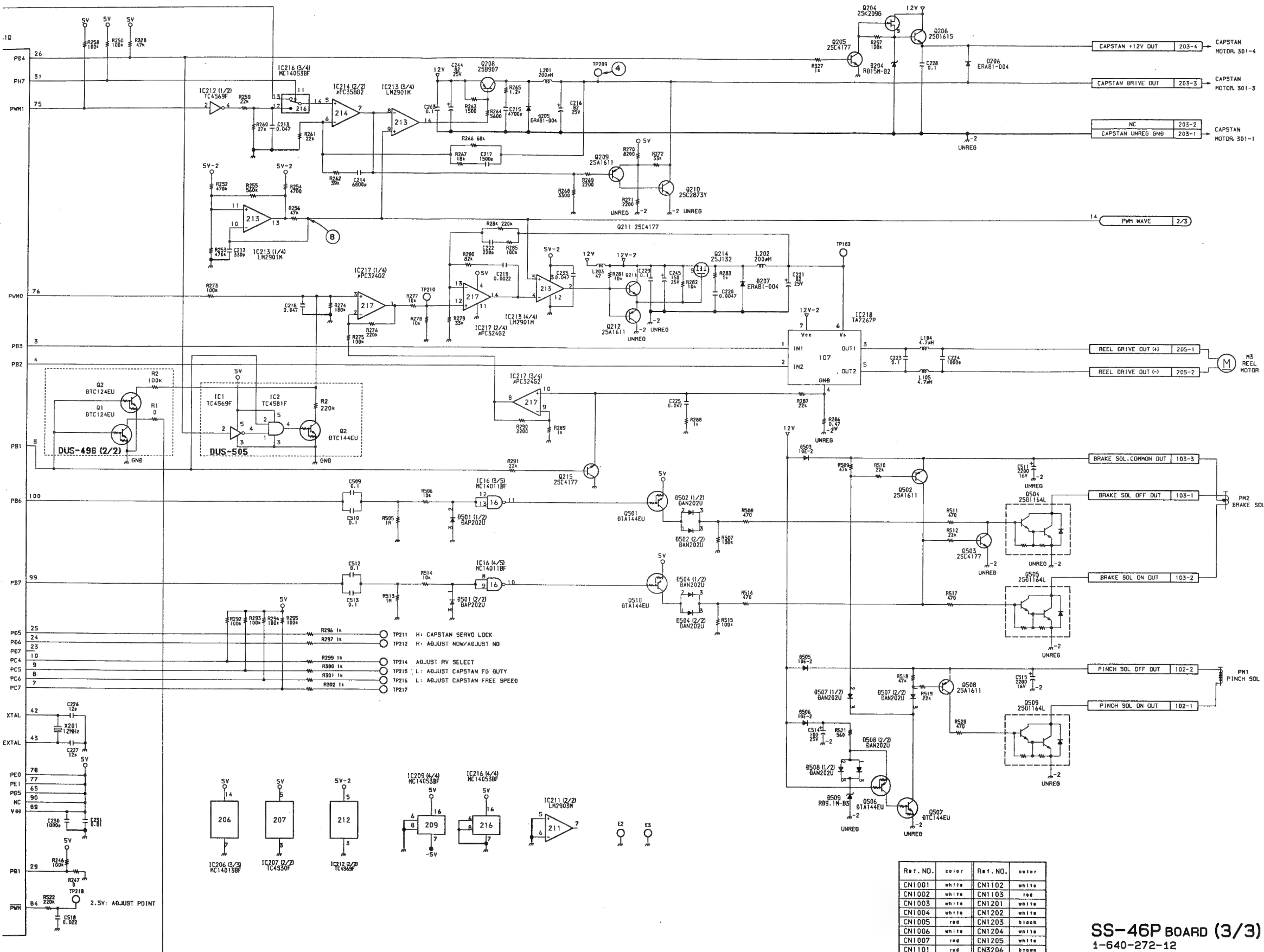
⑨ CN4-1 pin/CN7-1 pin 180mVp-p PB mode



⑤ TP206 REC CTL 40mVp-p REC mode





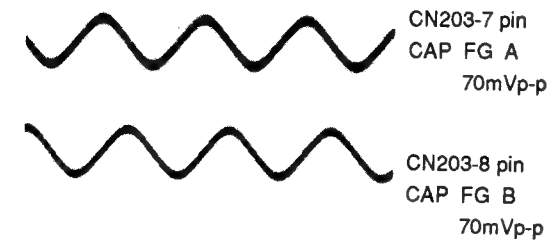


SS-46P BOARD (3/3)  
1-640-272-12  
PVV-1P (EK); #10101-10500

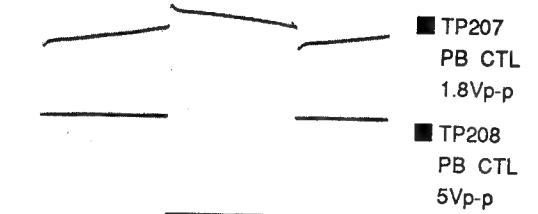
SS-46P (3/3)

S/N 10501 through 12390

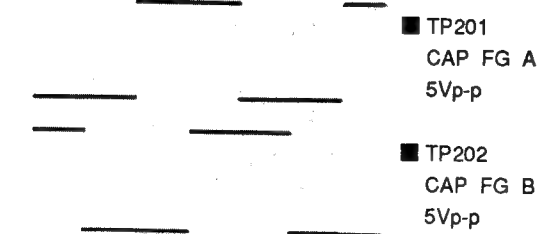
① REC mode



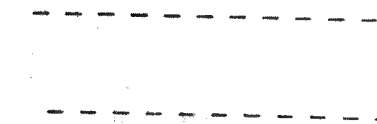
⑥ PB mode



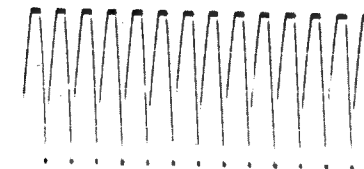
② REC mode



⑦ TP204 S REEL FG 5.3Vp-p FF/REW mode  
TP205 T REEL FG 5.3Vp-p FF/REW mode



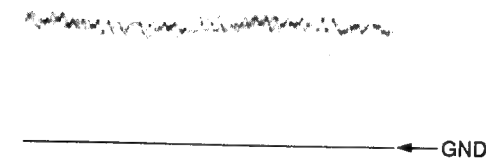
③ TP203 CAP STOP SERVO ERROR REC mode



⑧ IC213-5,7,9 PWM SAW 1.5Vp-p



④ TP209 CAP DRIVE 3.5Vdc REC mode

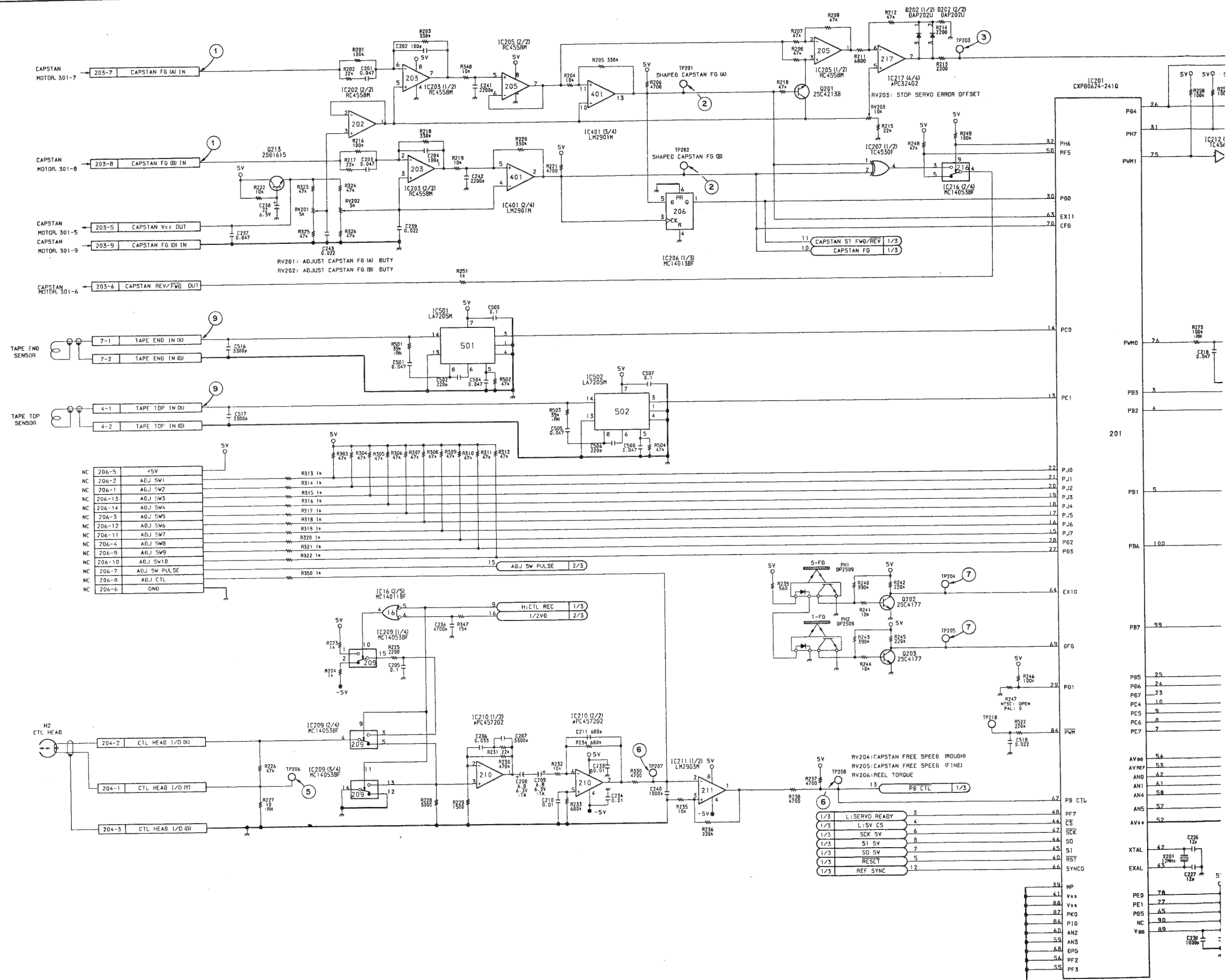


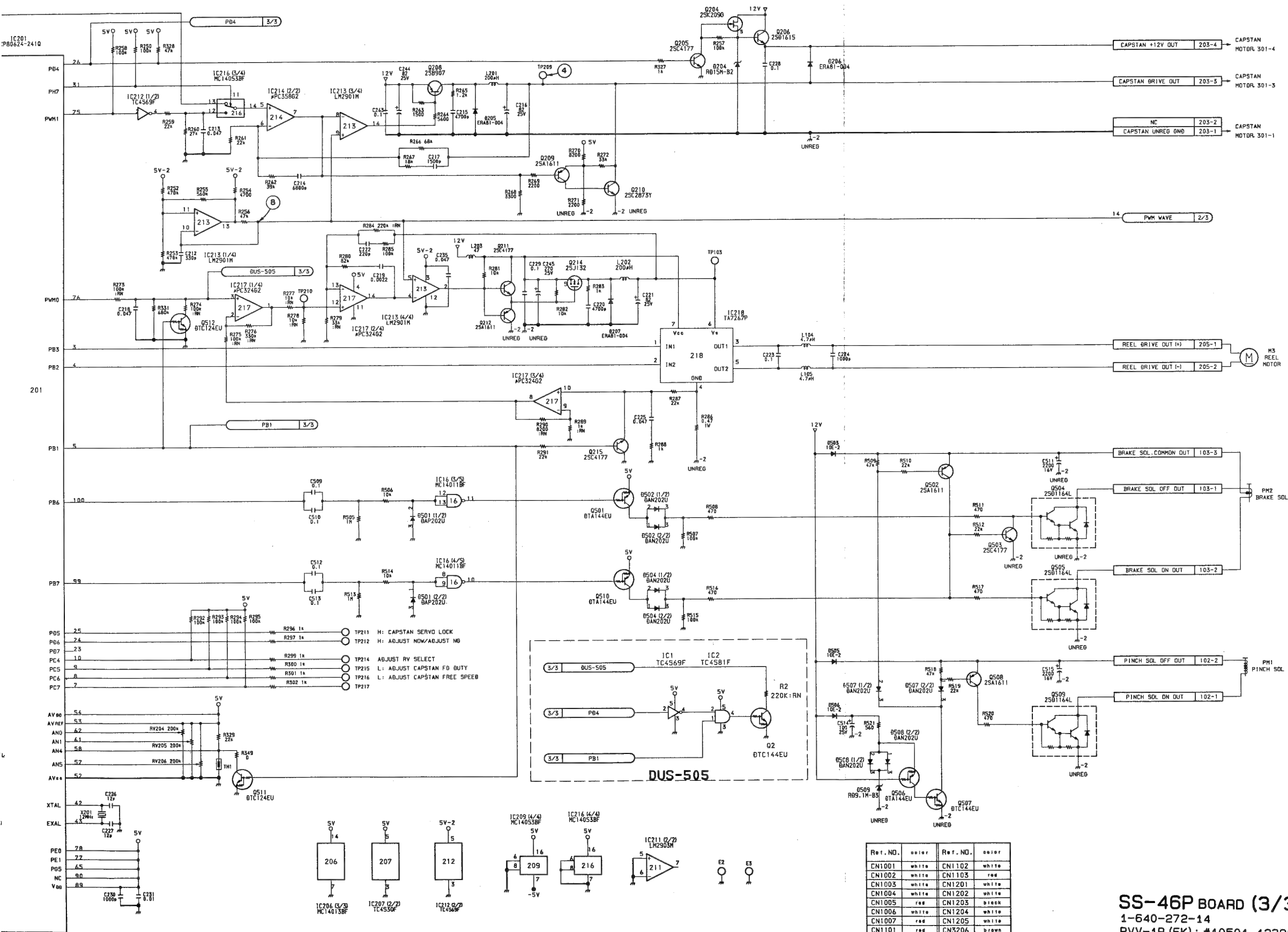
⑨ CN4-1 pin/CN7-1 pin 180mVp-p PB mode



⑤ TP206 REC CTL 40mVp-p REC mode

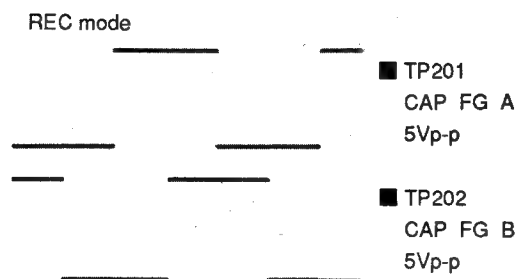
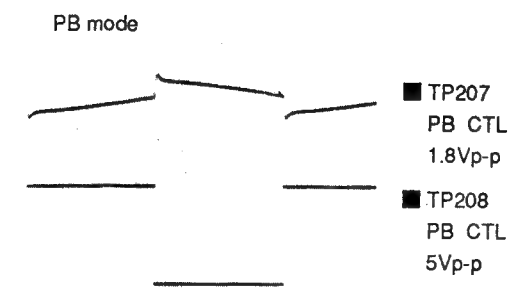
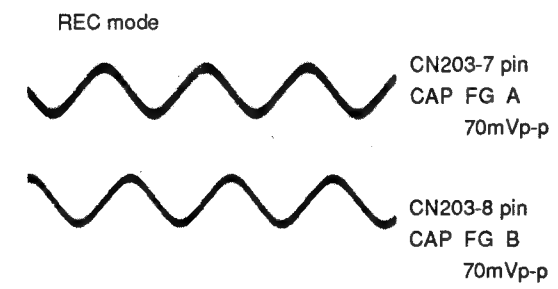






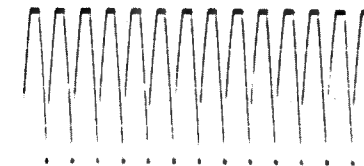
SS-46P BOARD (3/3)  
1-640-272-14  
PVV-1P (EK) ; #10501-12390

SS-46P (3/3) S/N 12391 and higher



TP204 S REEL FG 5.3Vp-p FF/REW mode  
TP205 T REEL FG 5.3Vp-p FF/REW mode

TP203 CAP STOP SERVO ERROR REC mode



IC213-5,7,9 PWM SAW 1.5Vp-p



TP209 CAP DRIVE 3.5Vdc REC mode



CN4-1 pin/CN7-1 pin 180mVp-p PB mode



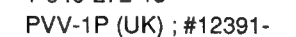
GND

TP206 REC CTL 40mVp-p REC mode







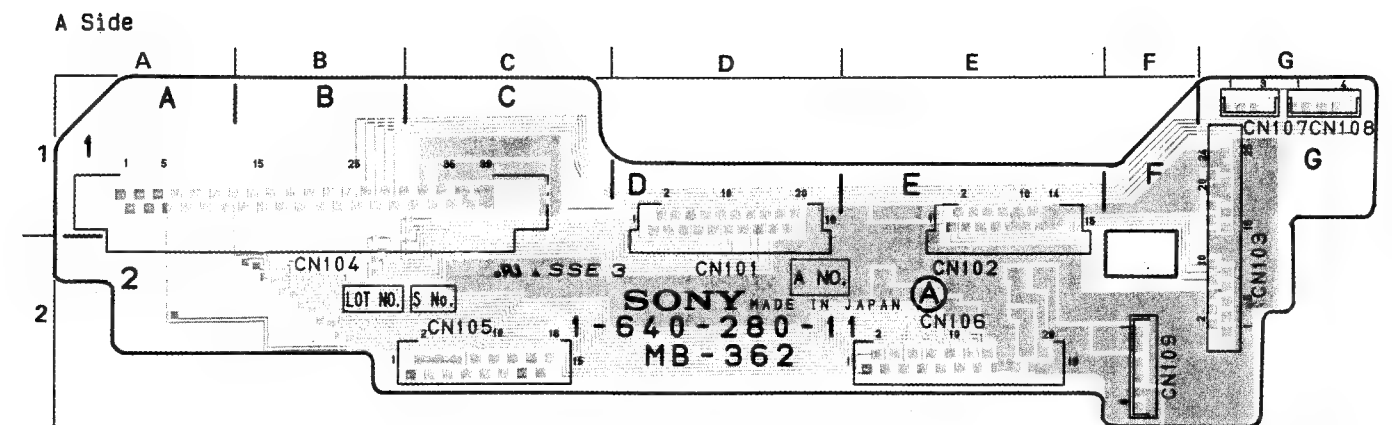


MB-362 BOARD  
Mother Board

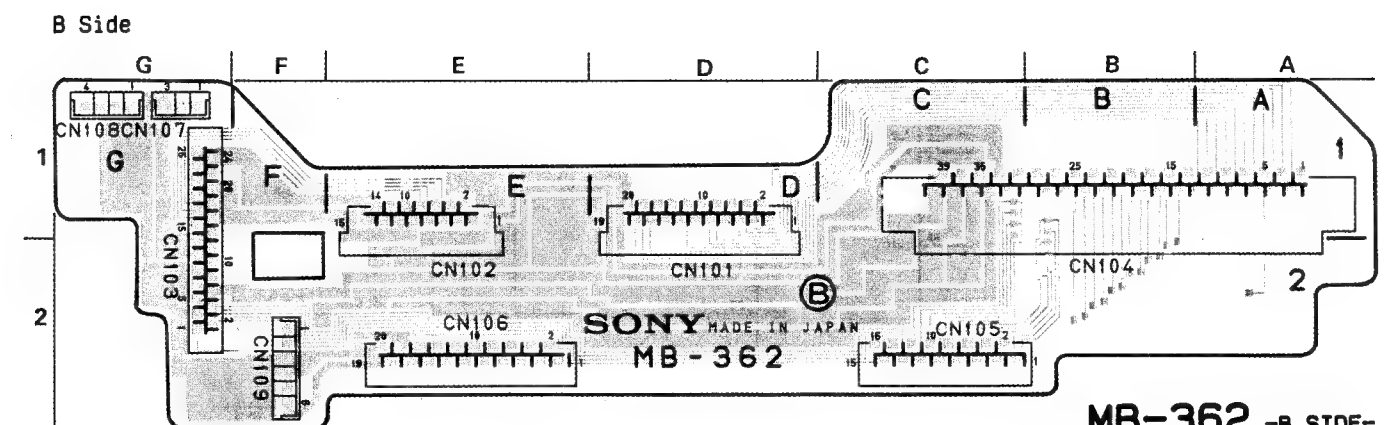
S/N 10001 through 10500

MB-362 (1-640-280-11)

CN101 D-2  
CN102 E-2  
CN103 G-2  
CN104 B-2  
CN105 C-2  
CN106 E-2  
CN107 G-1  
CN108 G-1  
CN109 F-2

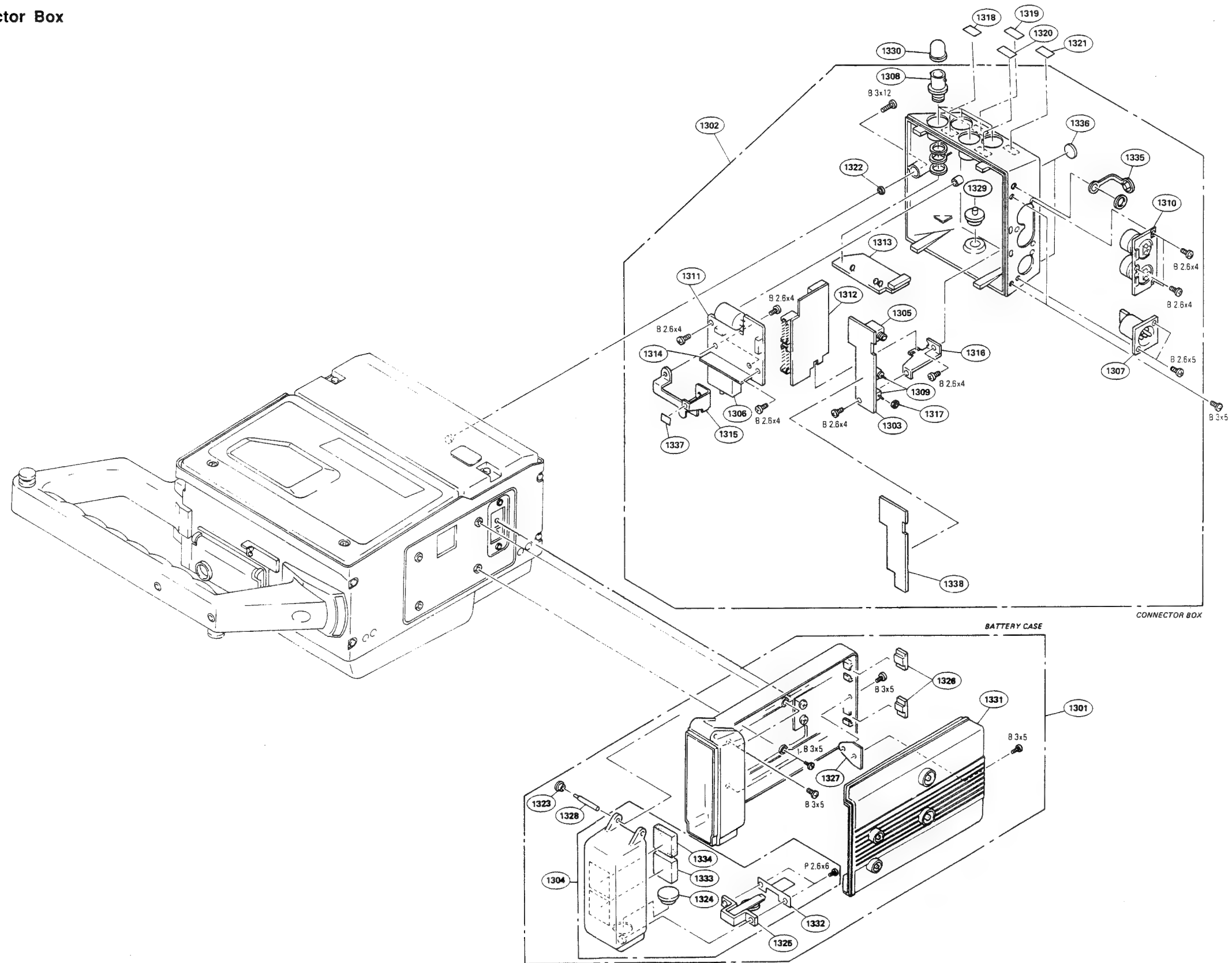


**MB-362 -A SIDE-**  
1-640-280-11  
PVV-1  
PVV-1P



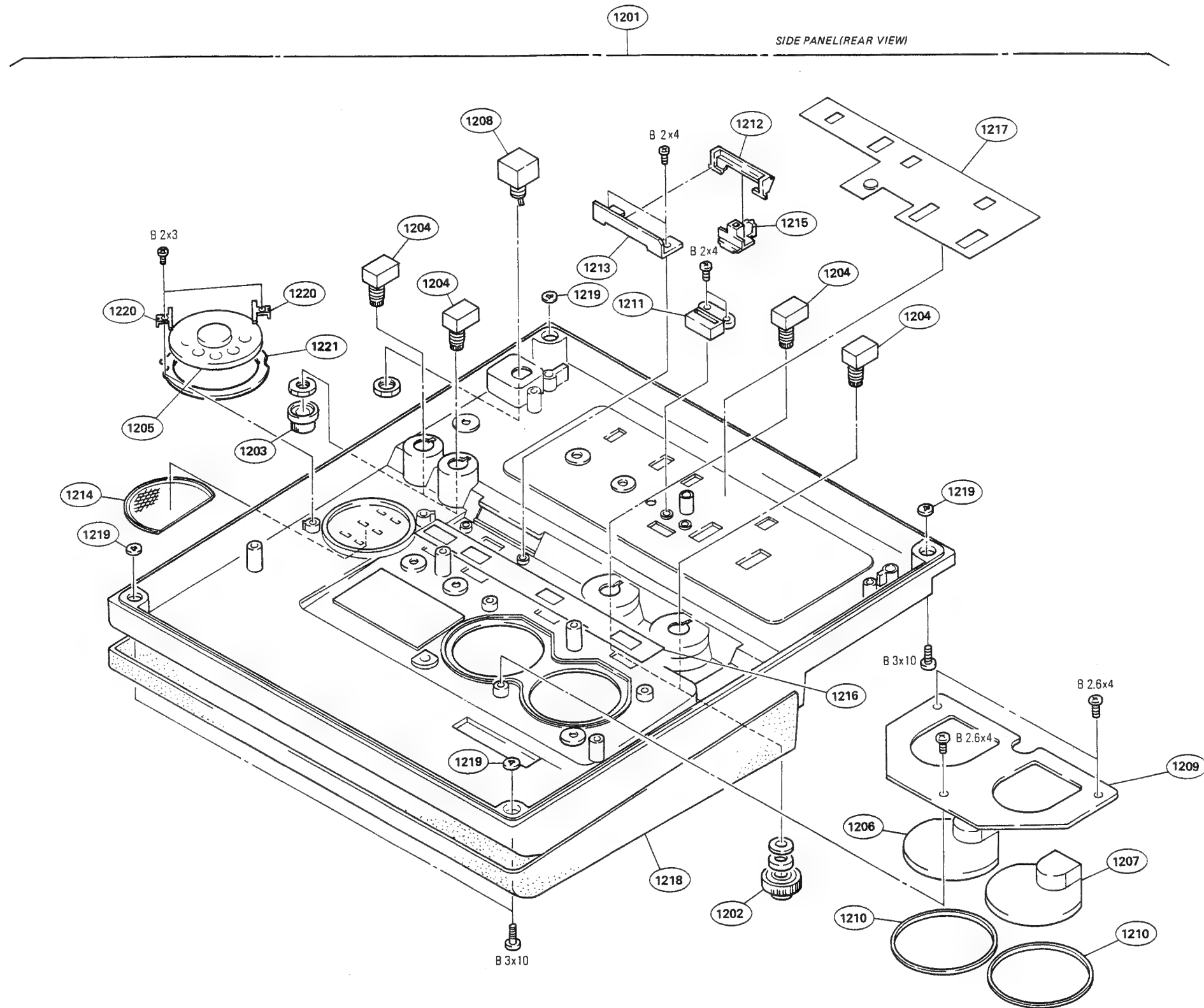
**MB-362 -B SIDE-**  
1-640-280-11  
PVV-1  
PVV-1P

Battery Case / Connector Box



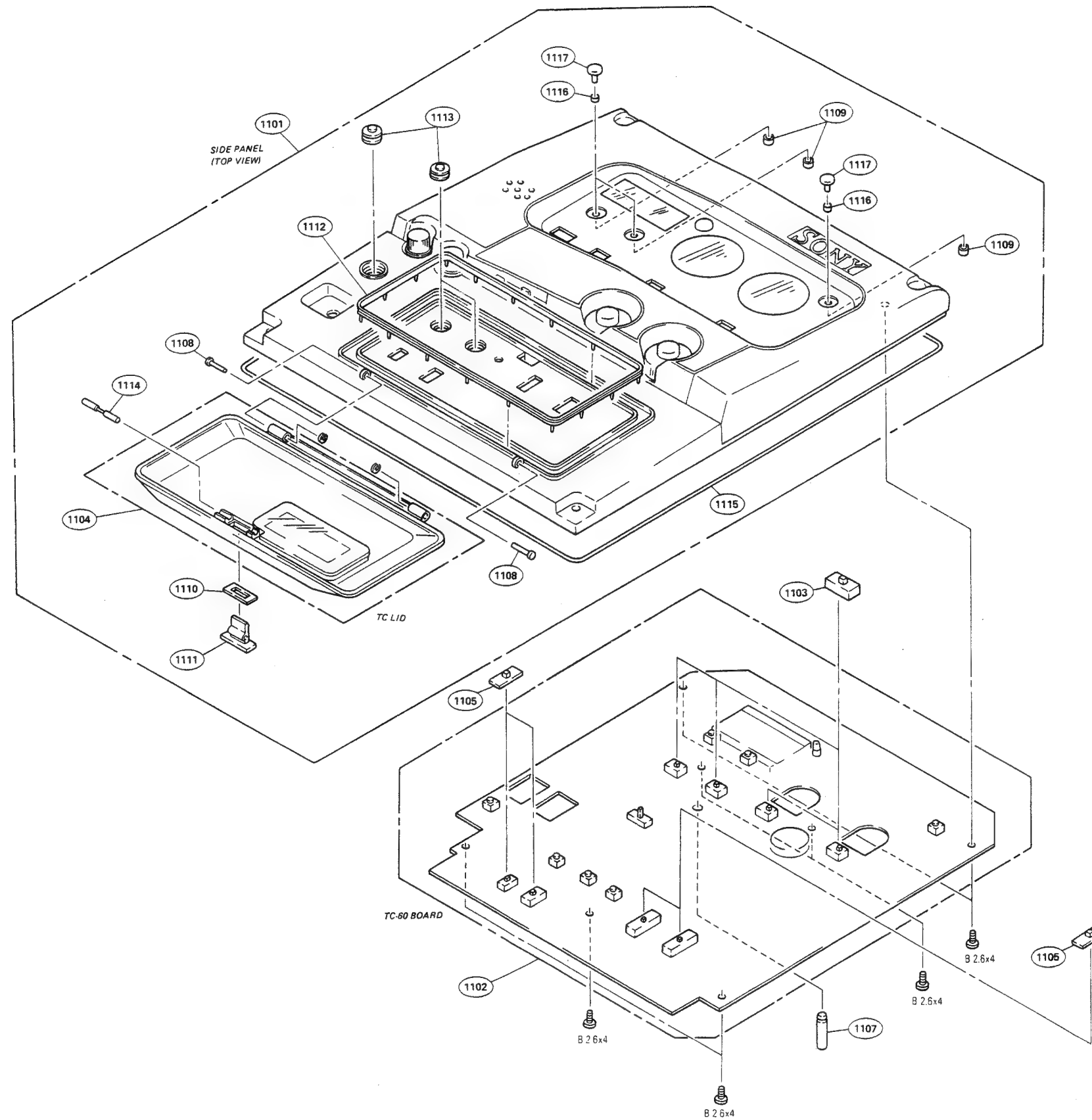
SIDE PANEL (2) SIDE PANEL (2)

Side Panel (2)

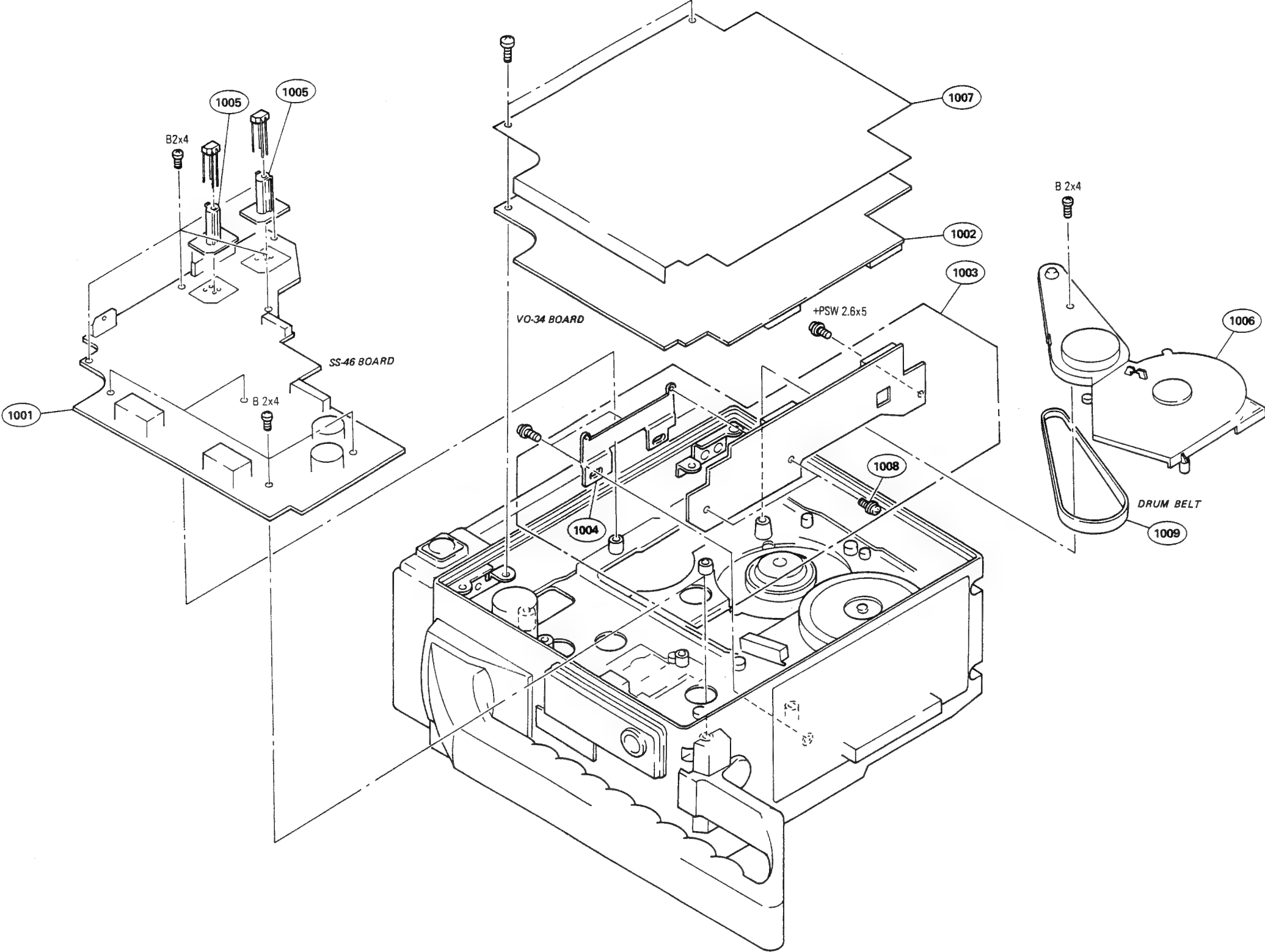


SIDE PANEL (1) SIDE PANEL (1)

Side Panel (1)

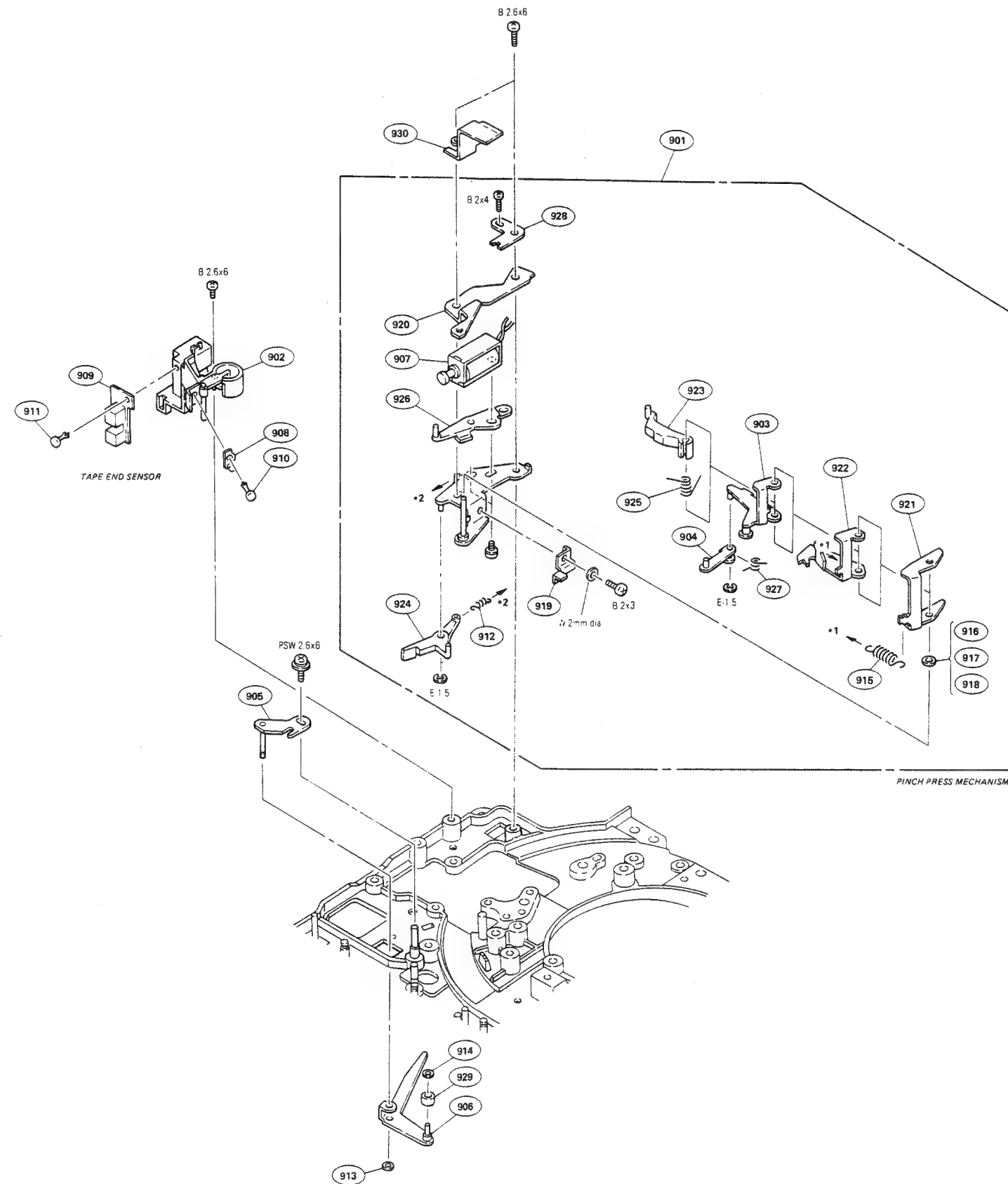


Reel Chassis (BACK SIDE)



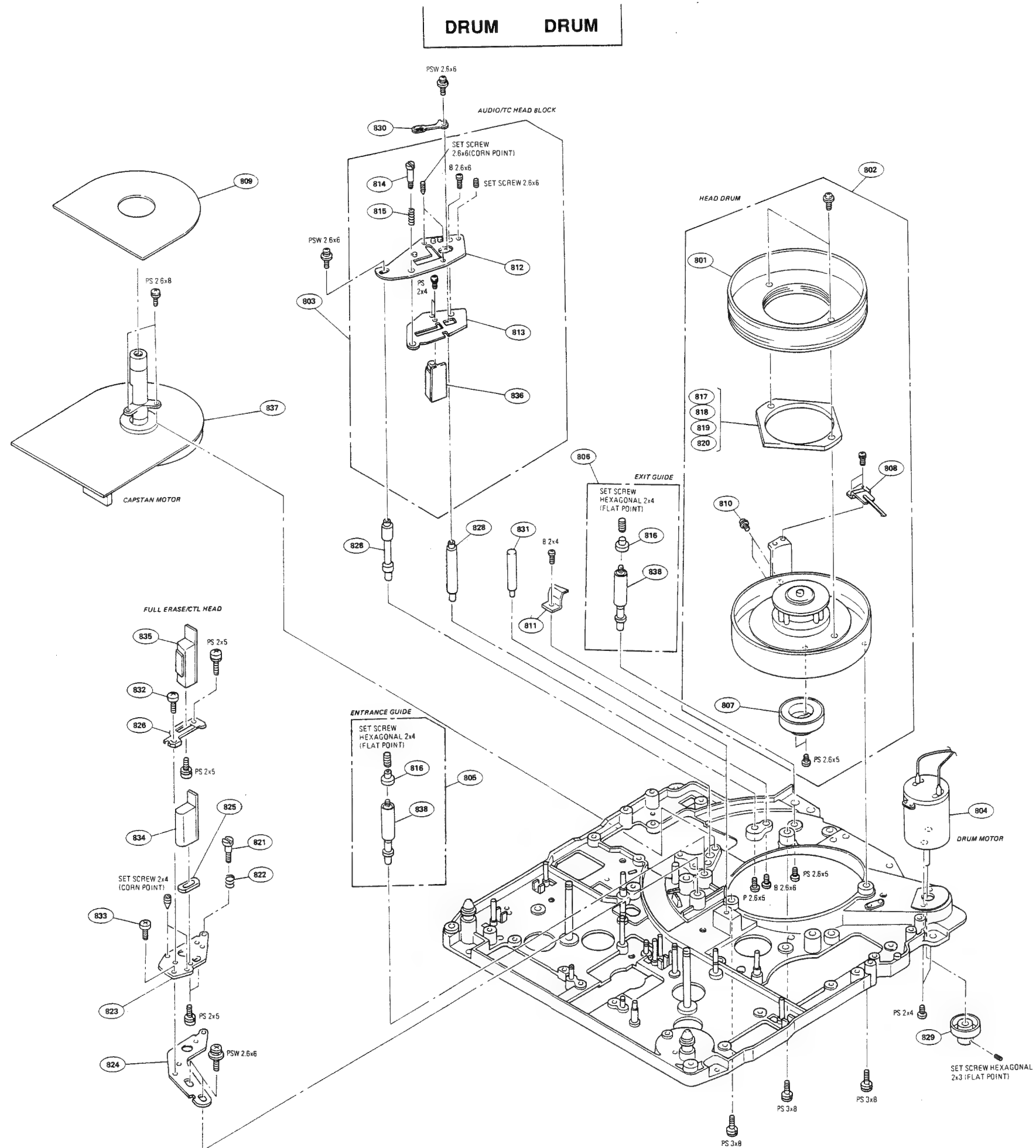
# PINCH PRESS MECHANISM      PINCH PRESS MECHANISM

## Pinch Press Mechanism



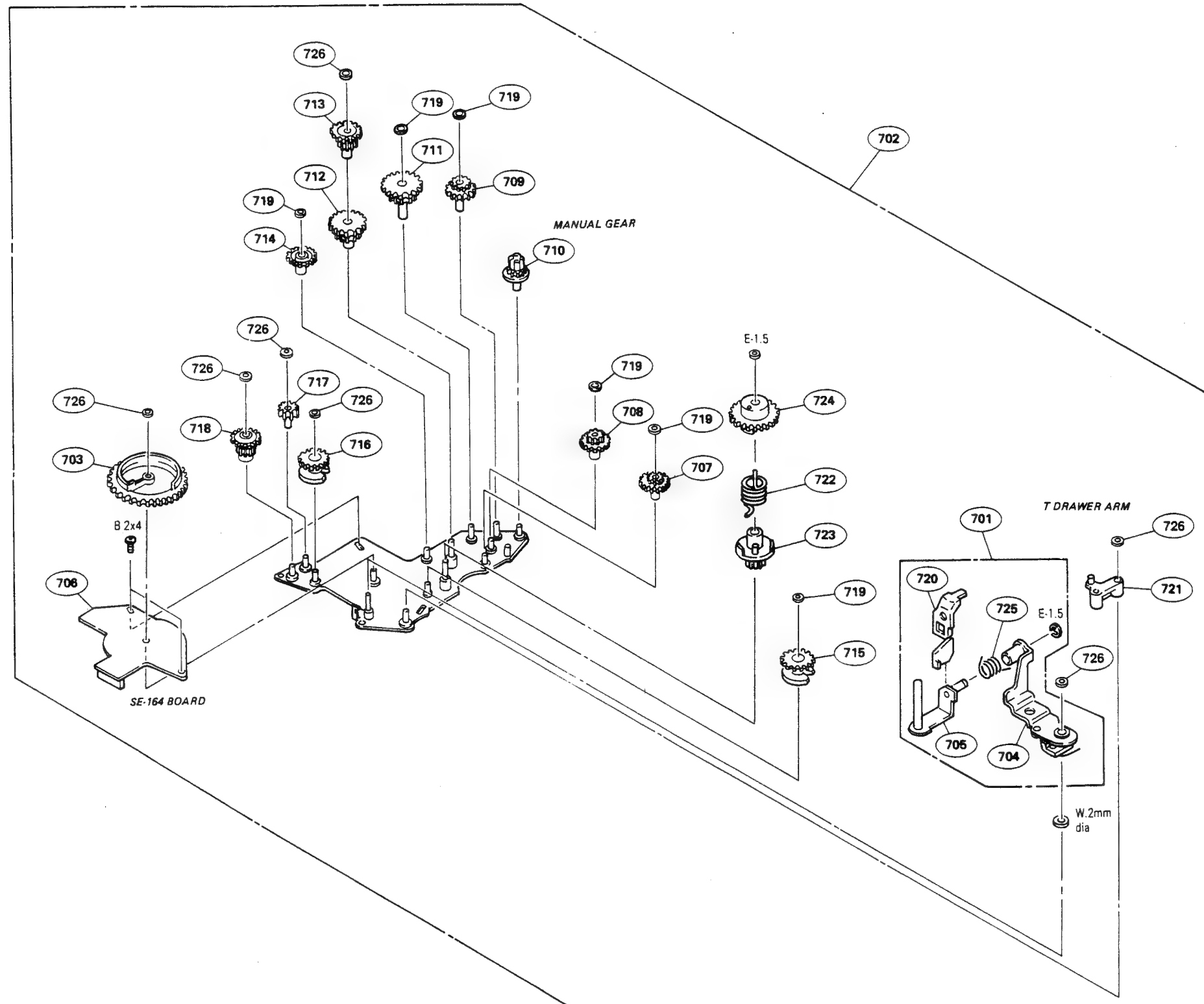


# Drum

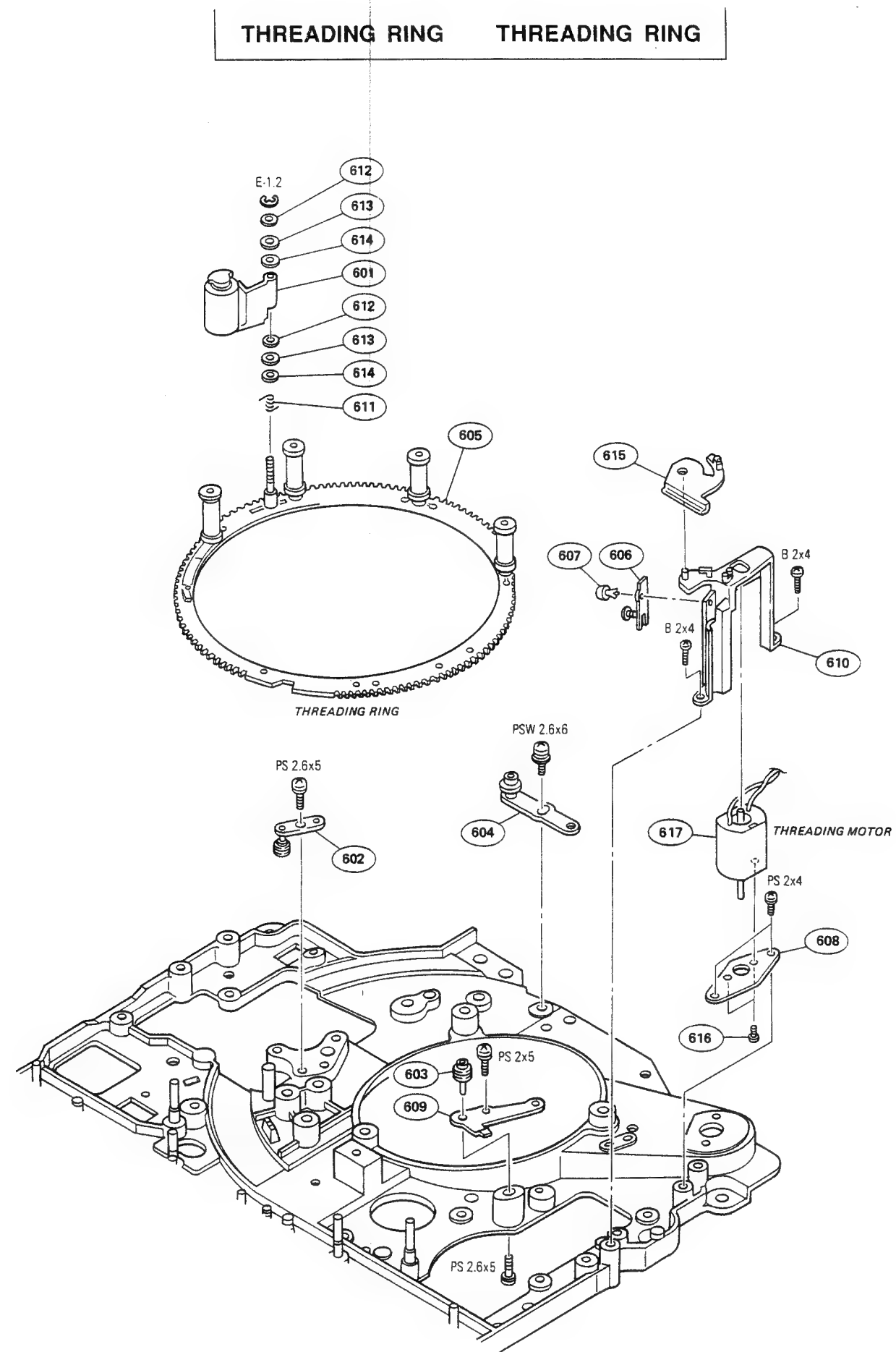


GEAR BLOCK GEAR BLOCK

Gear Block

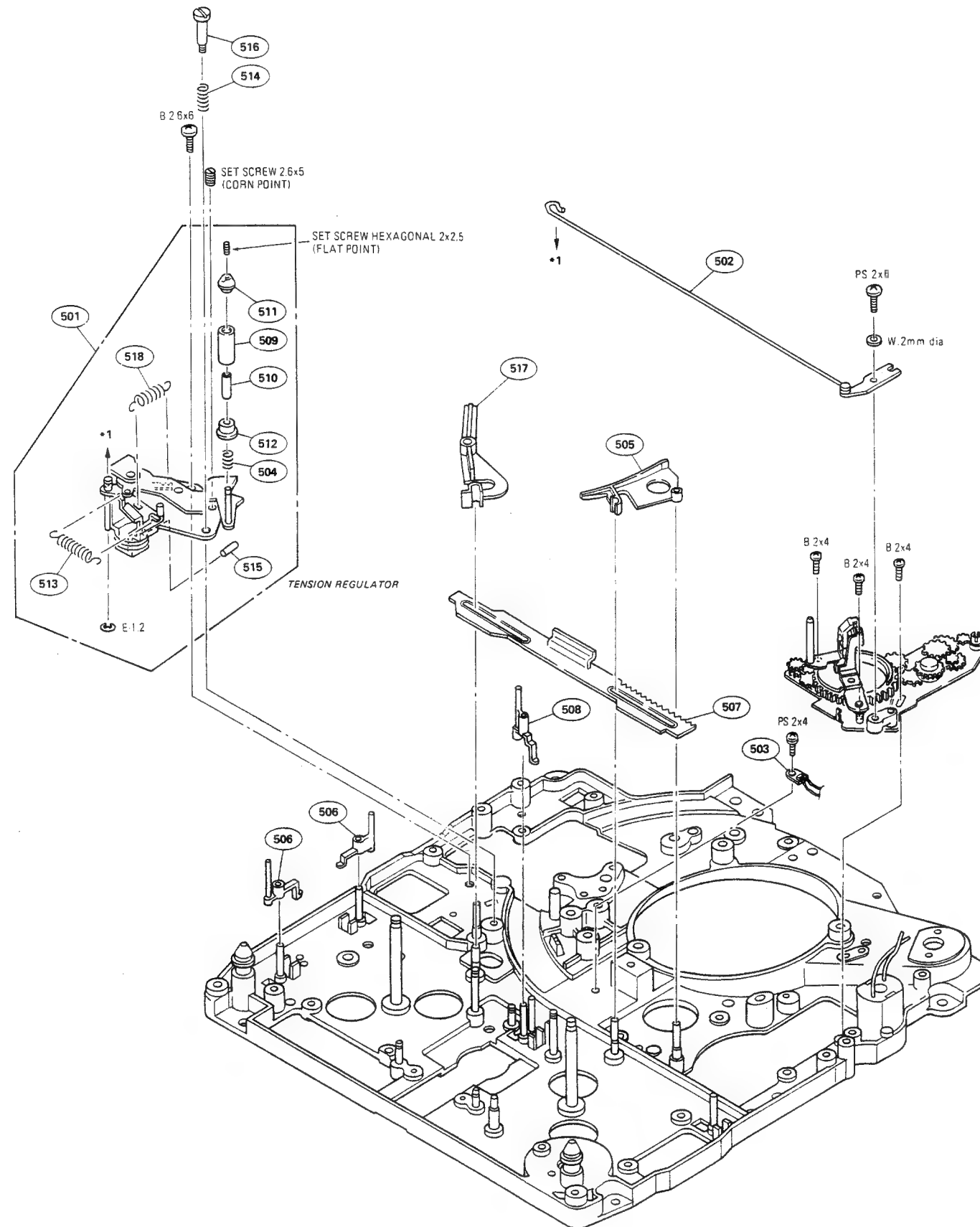


# Threading Ring



# TENSION REGULATOR BLOCK    TENSION REGULATOR BLOCK

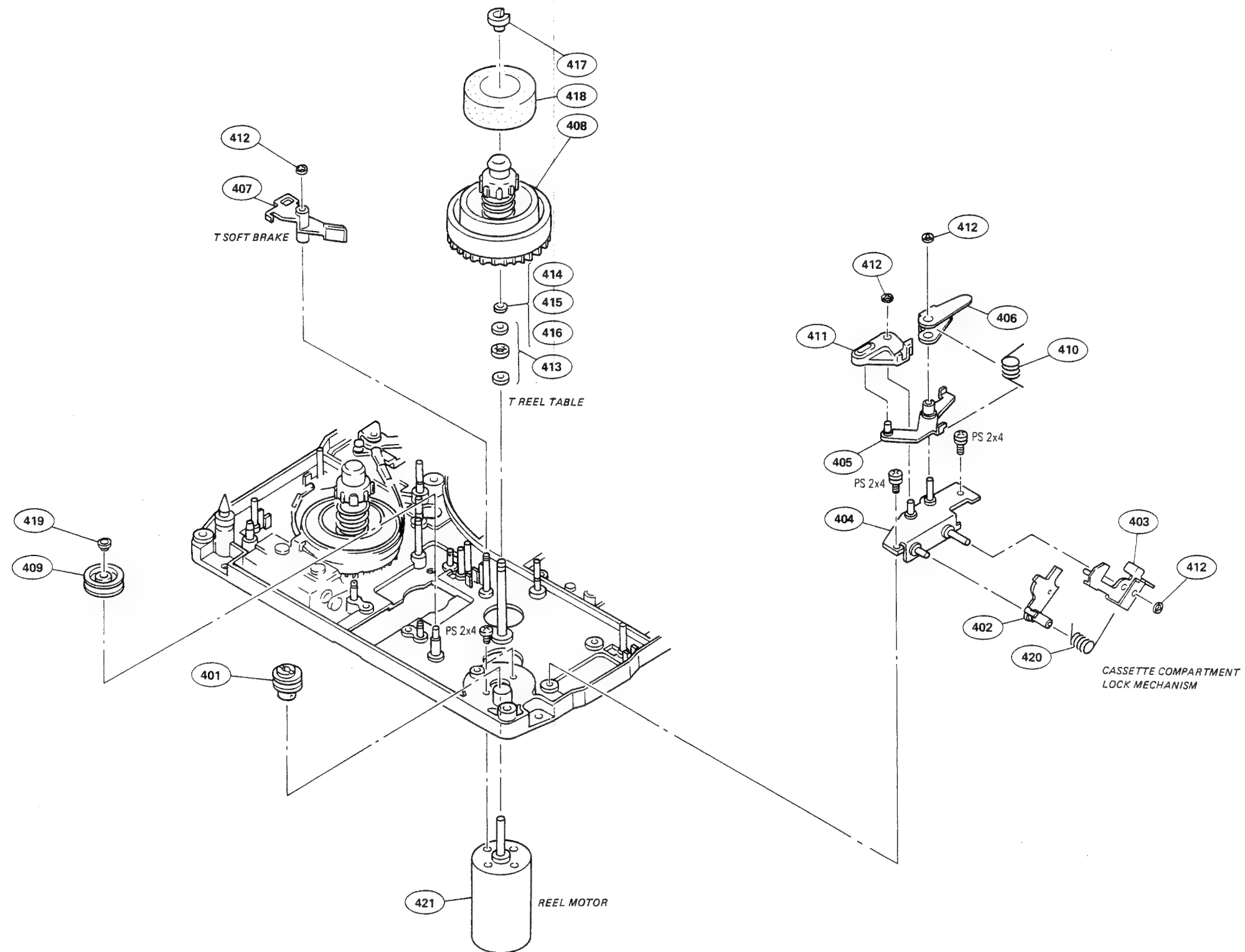
## Tension Regulator Block



# REEL DRIVE BLOCK (T SIDE)

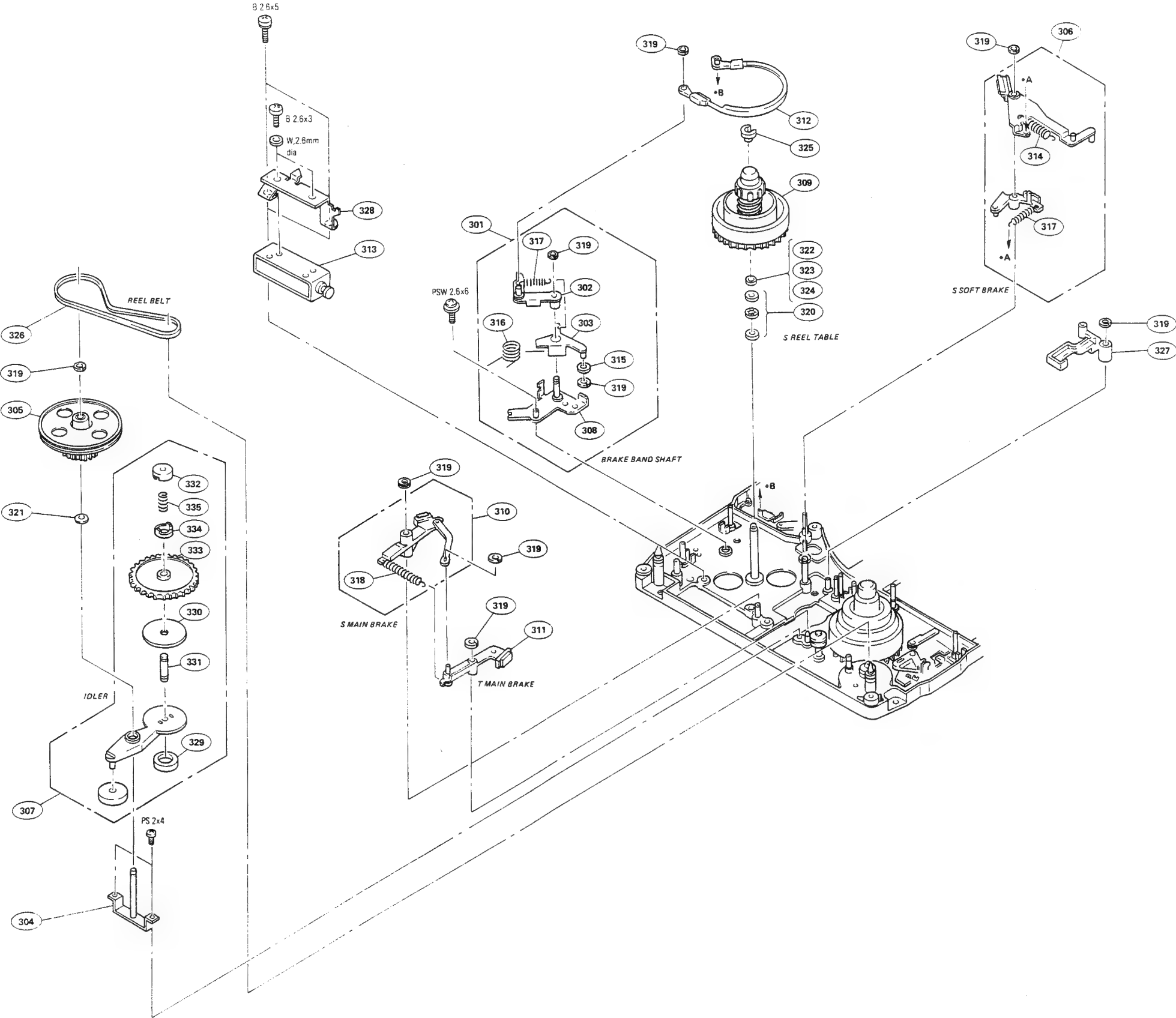
# REEL DRIVE BLOCK (T SIDE)

## Reel Drive Block (T SIDE)

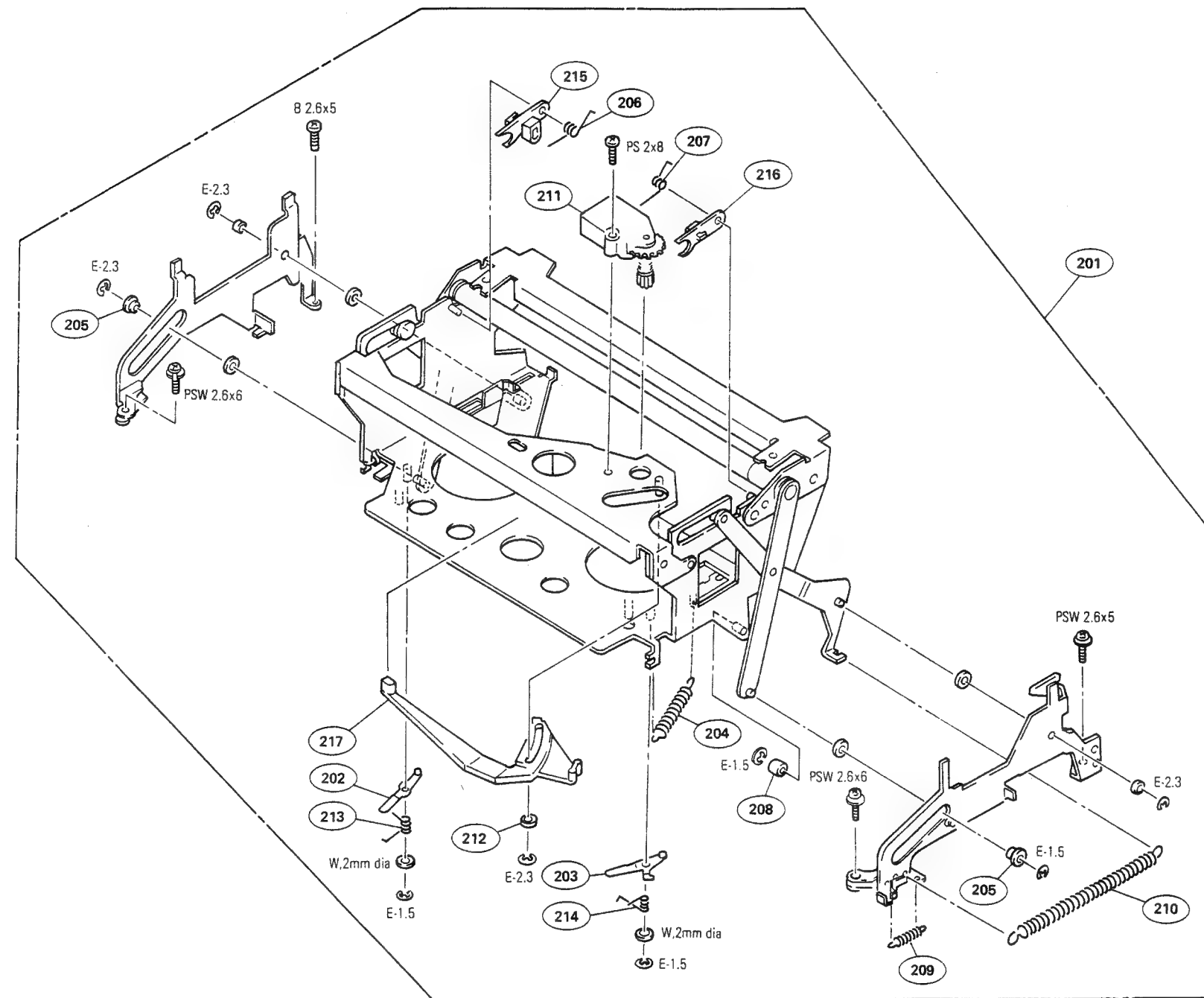


REEL DRIVE BLOCK (S SIDE)
REEL DRIVE BLOCK (S SIDE)

Reel Drive Block (S SIDE)



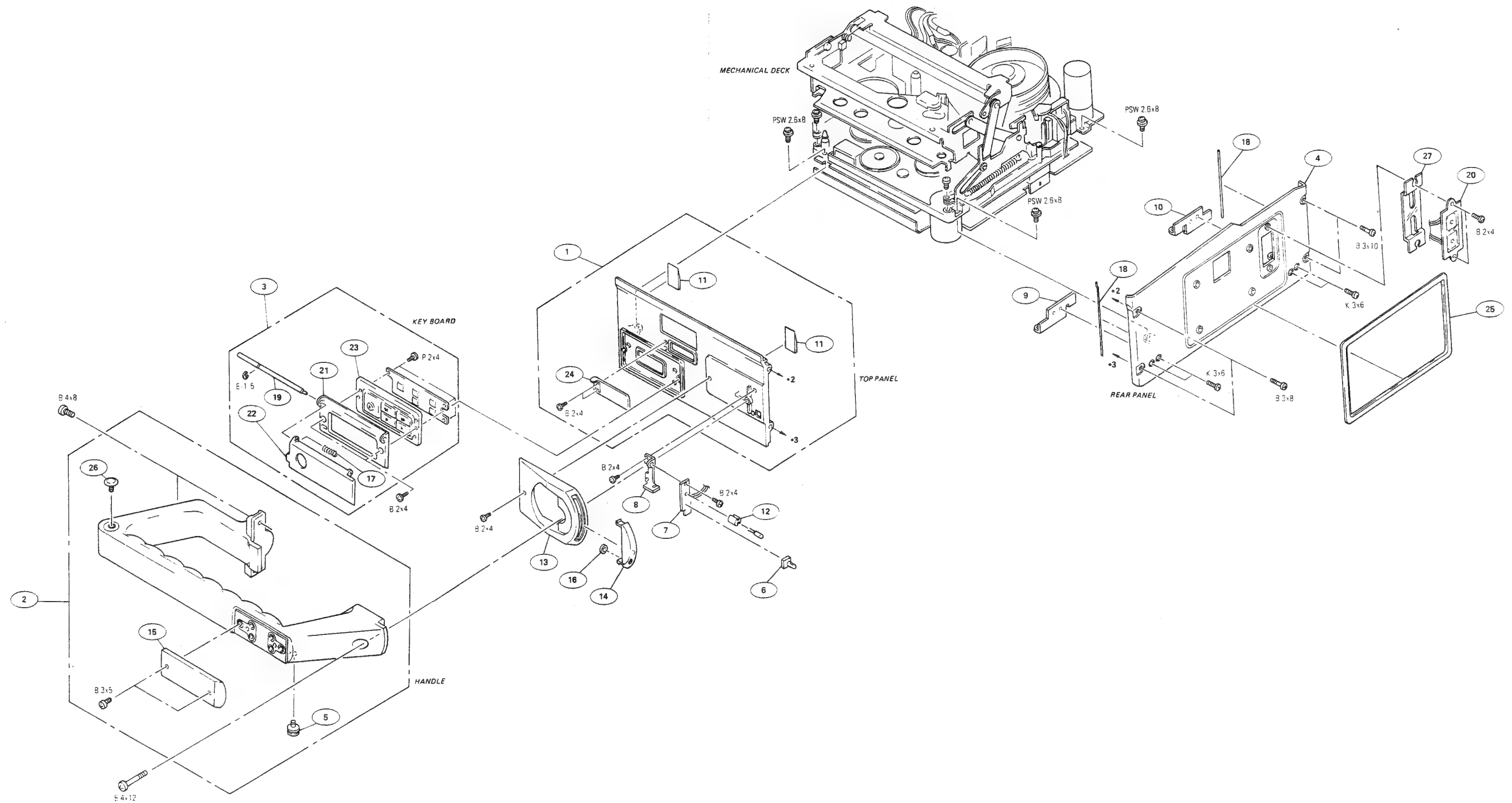
Cassette-up Compartment



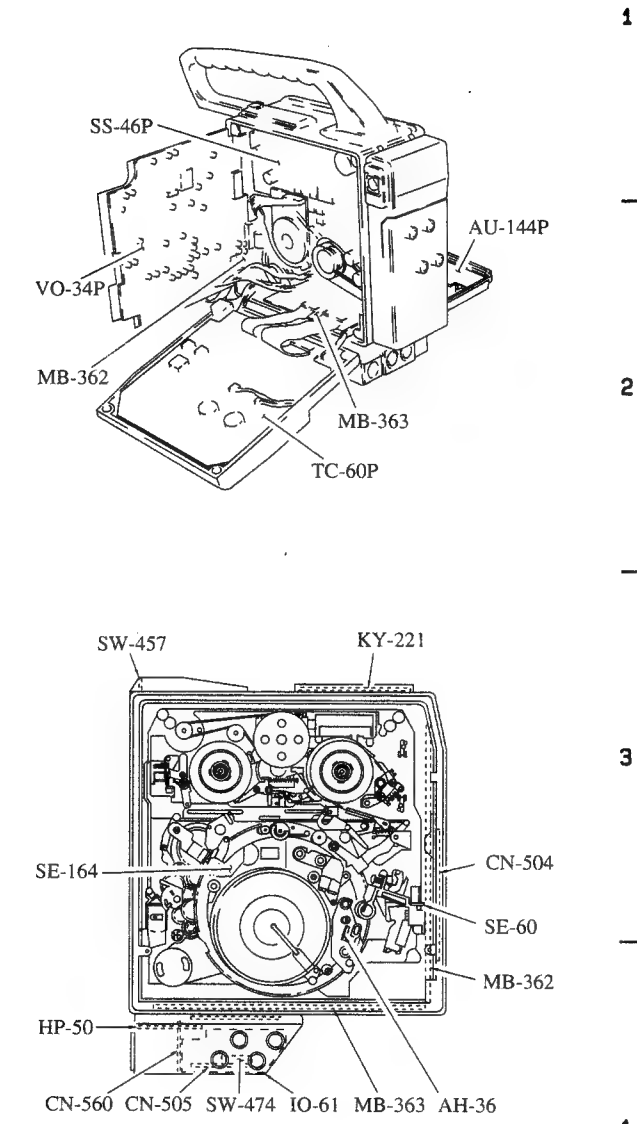
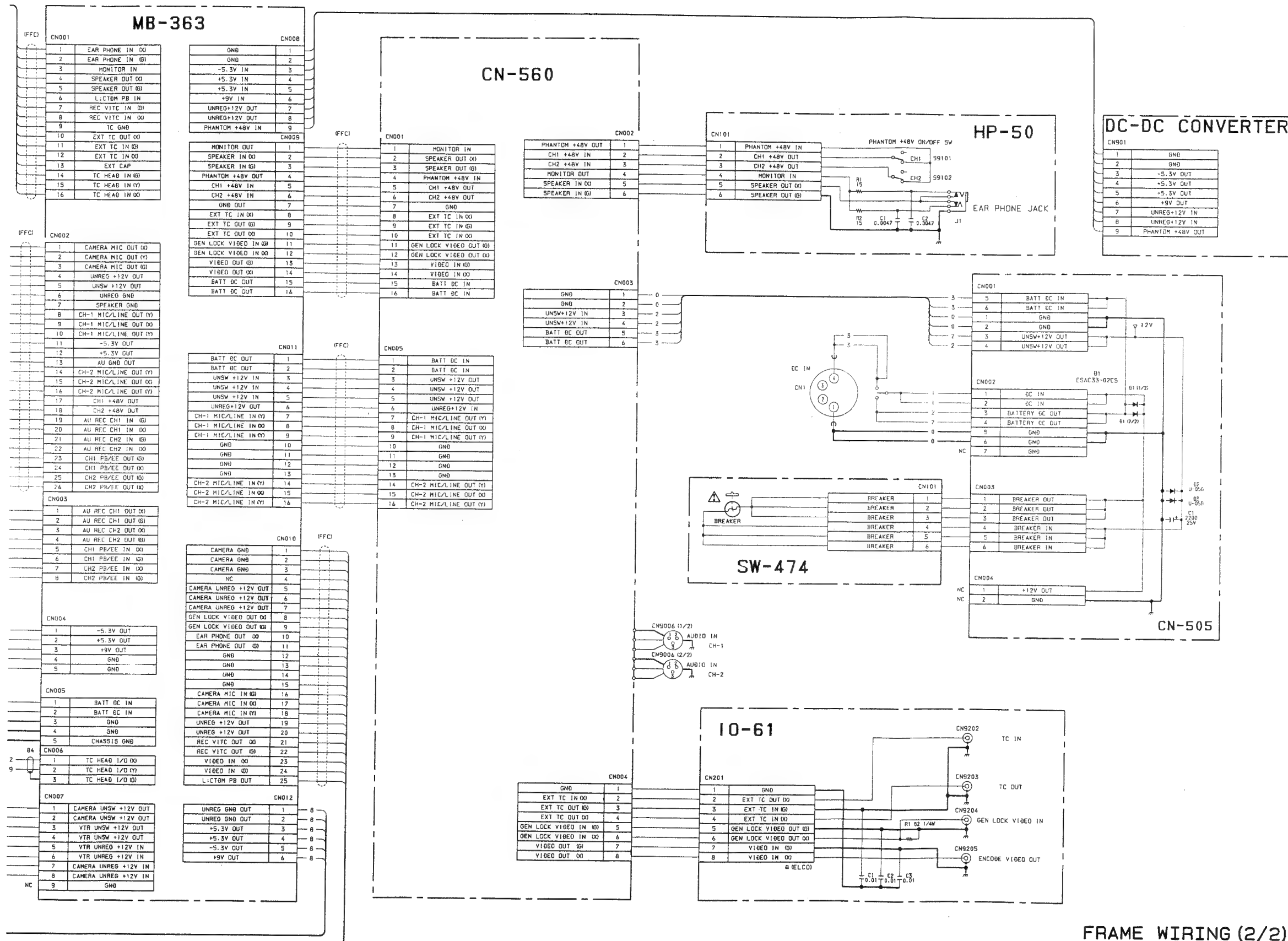




## Cabinet Block (1)

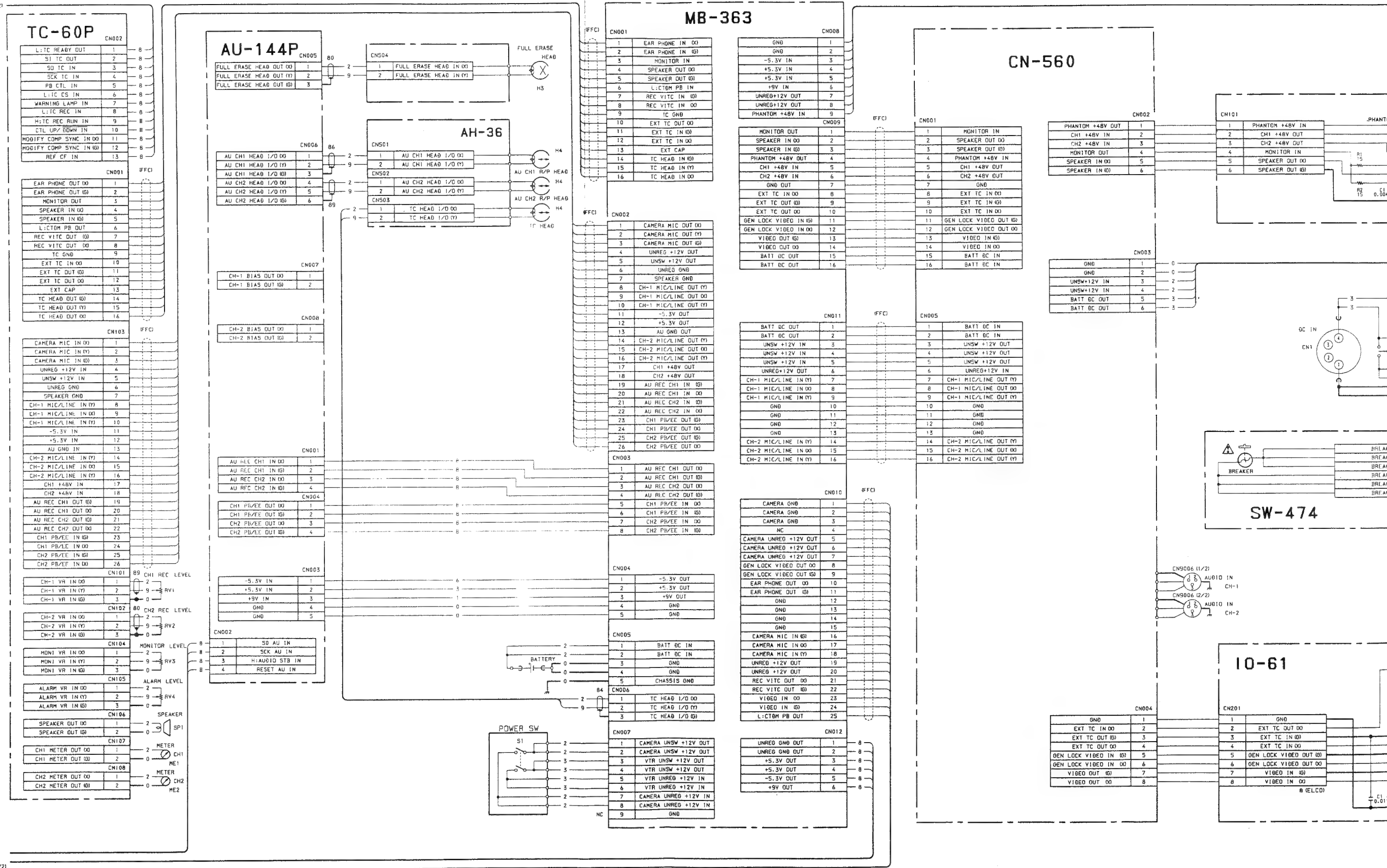


Location of the Printed Circuit Boards



FRAME WIRING (2/2)  
PVV-1P (EK) ; #10001-

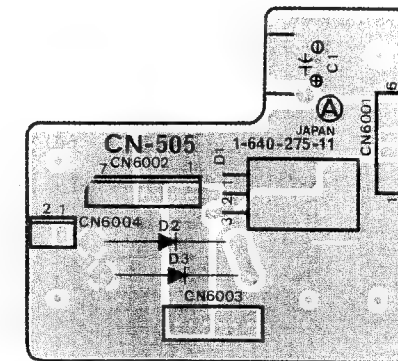
## FRAME WIRING (2/2)

TO/FROM  
FRAME WIRING (1/2)TO/FROM  
FRAME WIRING (1/2)

### CN-505 BOARD

DC Input Power/Breaker Relay

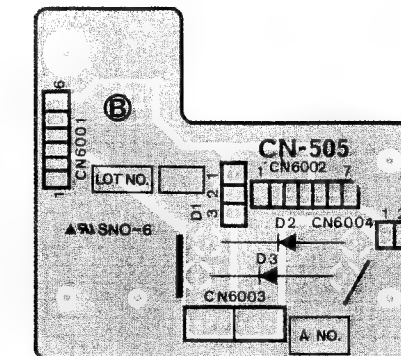
A Side



**CN-505 -A SIDE-**

1-640-275-11  
PVV-1  
PVV-1P

B Side



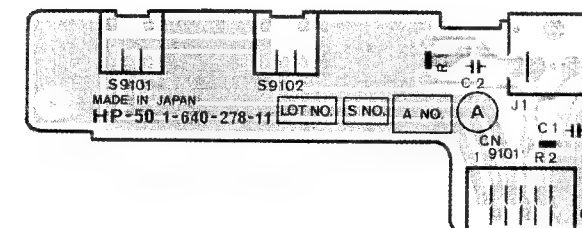
**CN-505 -B SIDE-**

1-640-275-11  
PVV-1  
PVV-1P

### HP-50 BOARD

Earphone, Phantom ON/OFF Switch

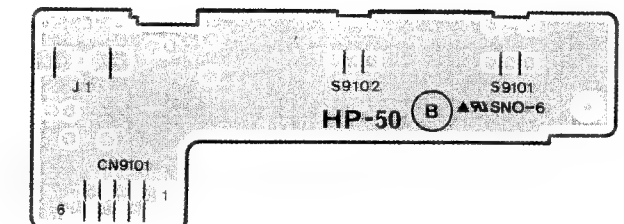
A Side



**HP-50 -A SIDE-**

1-640-278-11  
PVV-1  
PVV-1P

B Side



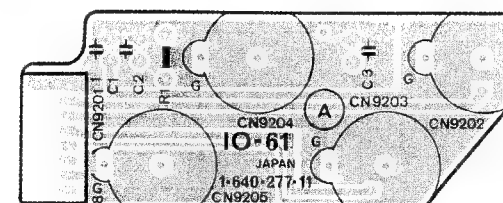
**HP-50 -B SIDE-**

1-640-278-11  
PVV-1  
PVV-1P

### IO-61 BOARD

BNC Connector

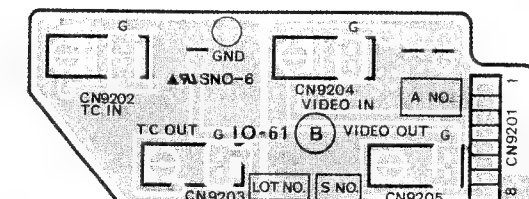
A Side



**IO-61 -A SIDE-**

1-640-277-11  
PVV-1  
PVV-1P

B Side



**IO-61 -B SIDE-**

1-640-277-11  
PVV-1  
PVV-1P

### SW-474 BOARD

Breaker

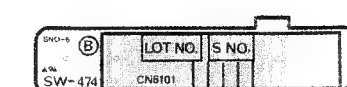
A Side



**SW-474 -A SIDE-**

1-640-279-11  
PVV-1  
PVV-1P

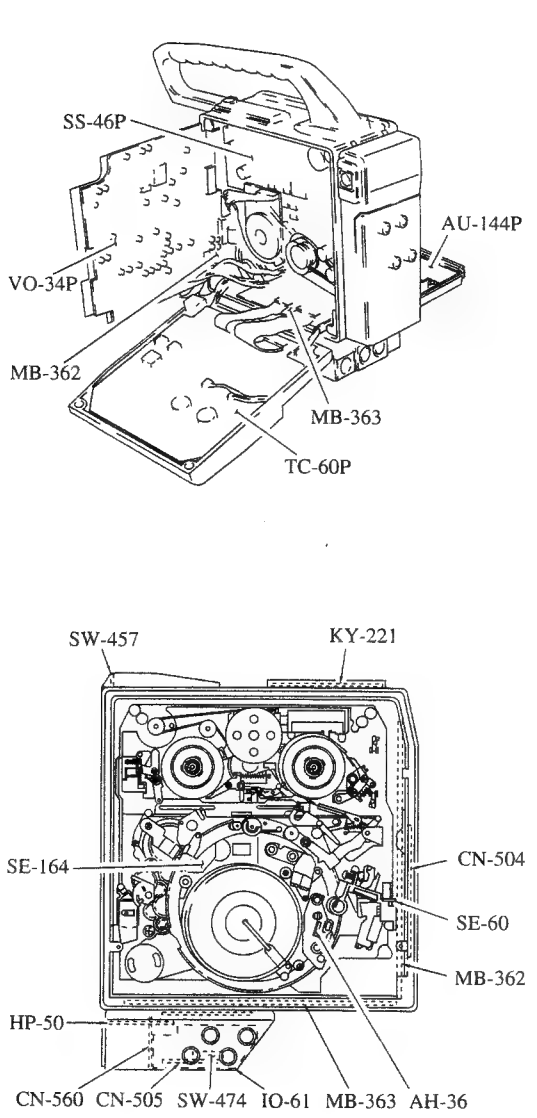
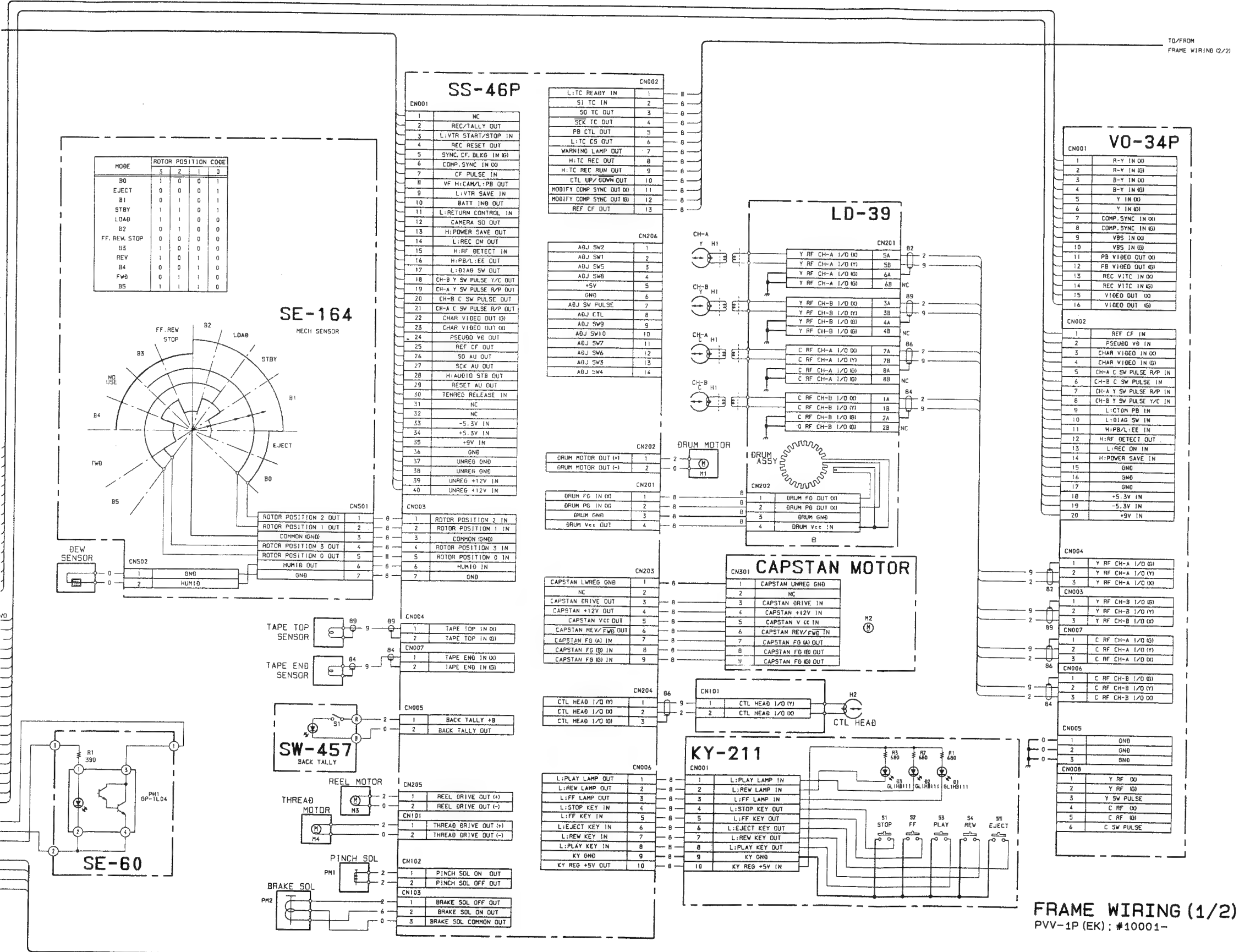
B Side



**SW-474 -B SIDE-**

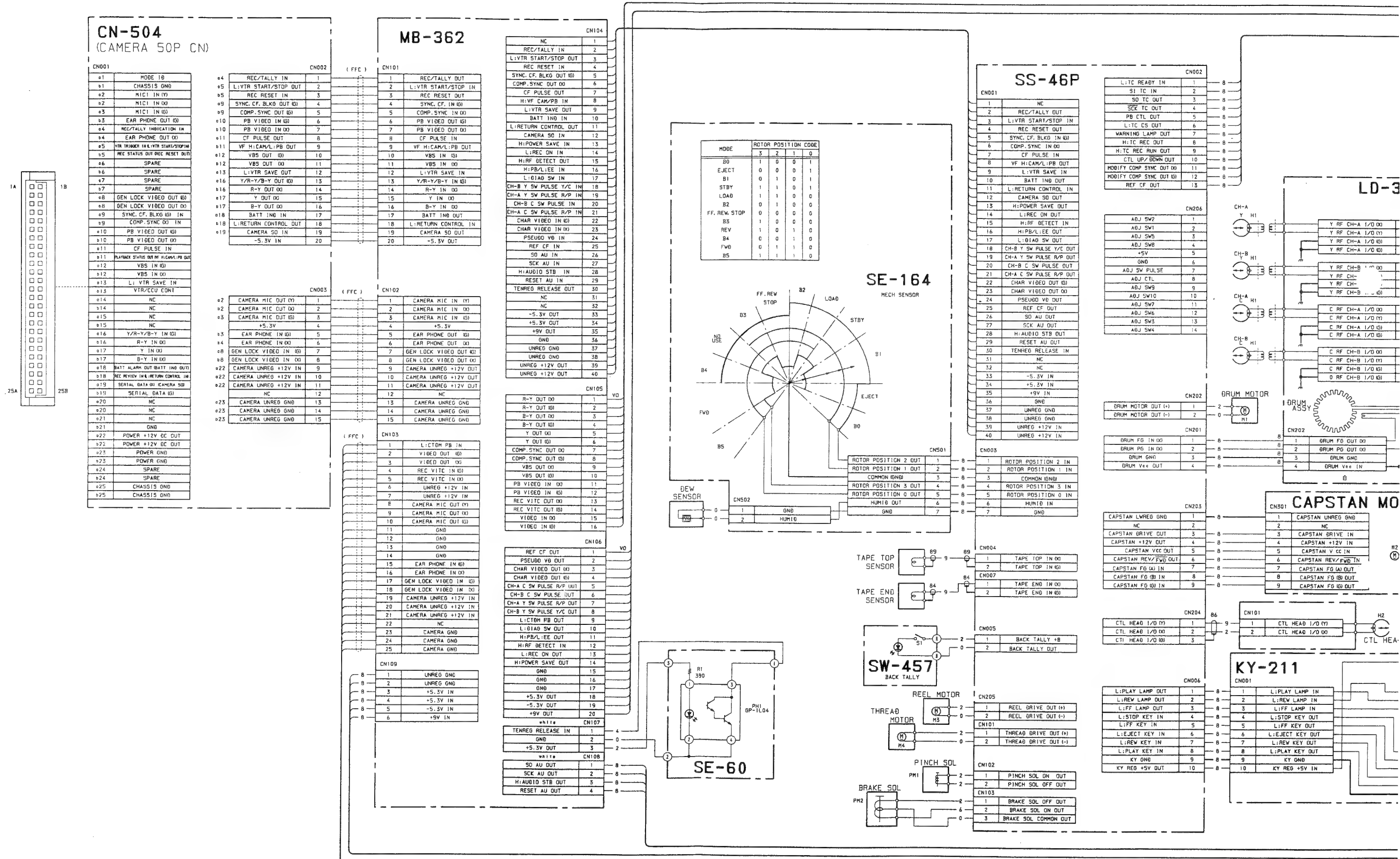
1-640-279-11  
PVV-1  
PVV-1P

Location of the Printed Circuit Boards



FRAME WIRING (1/2)  
PVV-1P (EK) ; #10001-

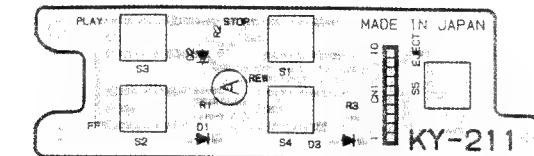
## FRAME WIRING (1/2)





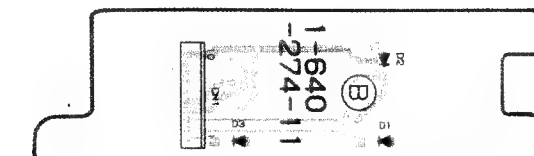
**KY-211 BOARD**  
Function Key

A Side



**KY-211 -A SIDE-**  
1-640-274-11  
PVV-1  
PVV-1P

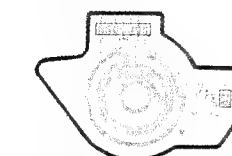
B Side



**KY-211 -B SIDE-**  
1-640-274-11  
PVV-1  
PVV-1P

**SE-164 BOARD**  
Mechanical Sensor  
DEW Sensor Relay

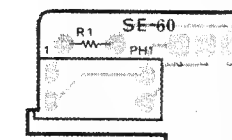
B Side



**SE-164**  
-B SIDE-  
1-640-284-11  
PVV-1  
PVV-1P

**SE-60 BOARD**  
Tension Regulator Sensor

A Side



**SE-60**  
-A SIDE-  
1-622-630-13  
PVV-1  
PVV-1P

**SW-457 BOARD**  
Backtally Switch

A Side



**SW-457 -A SIDE-**  
1-640-282-11  
PVV-1  
PVV-1P

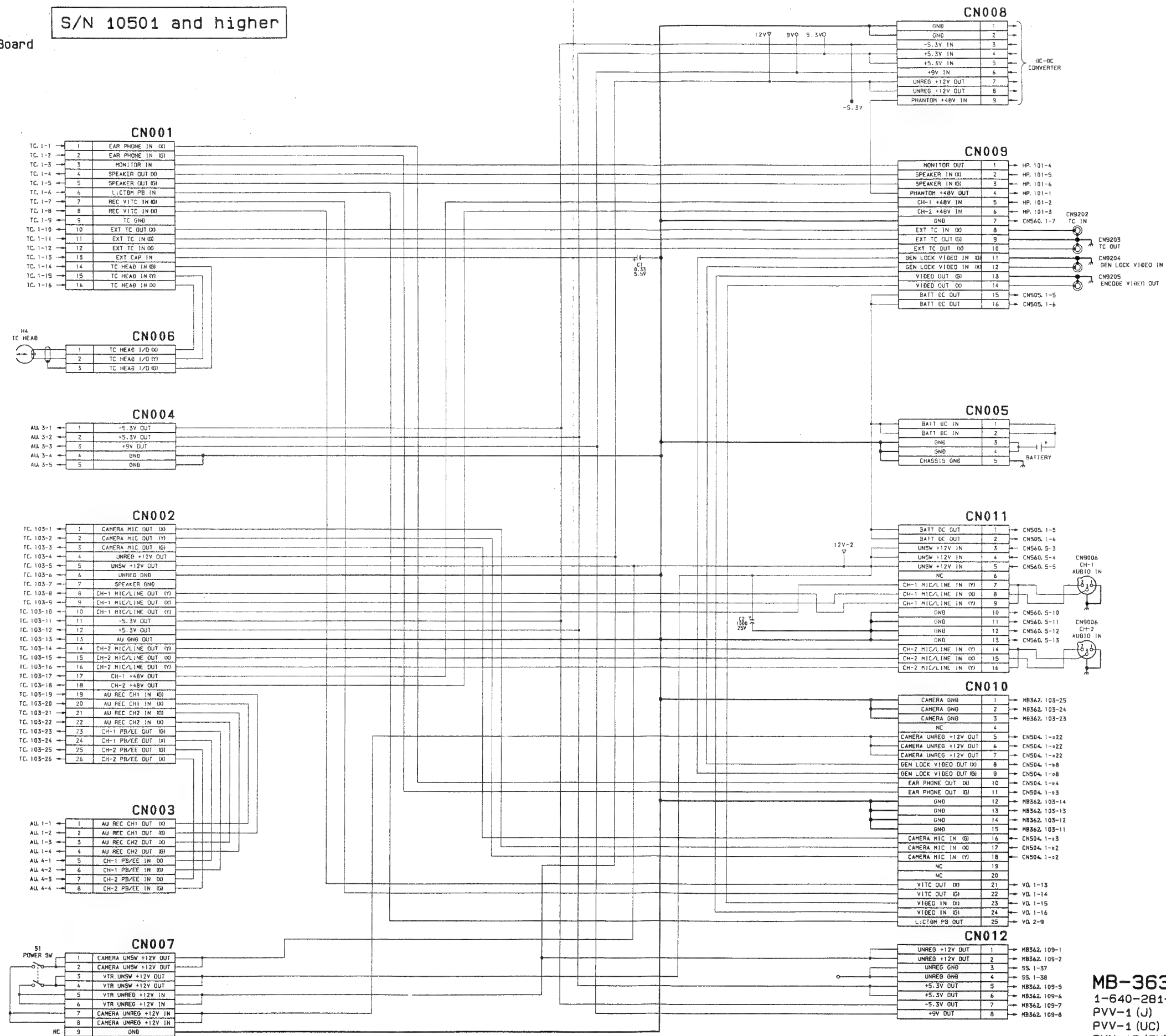
B Side



**SW-457 -B SIDE-**  
1-640-282-11  
PVV-1  
PVV-1P

MB-363 BOARD  
Mother Board

S/N 10501 and higher



MB-363 BOARD  
1-640-281-12, 13, 14  
PVV-1 (J) : #10461-  
PVV-1 (UC) : #10841-  
PVV-1P (EK) : #10501-





MB-363 MB-363

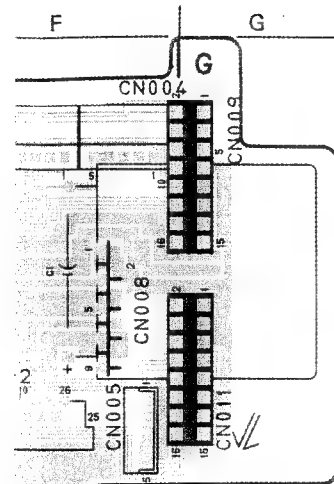
MB-363 BOARD  
Mother Board

S/N 10801 through 11420

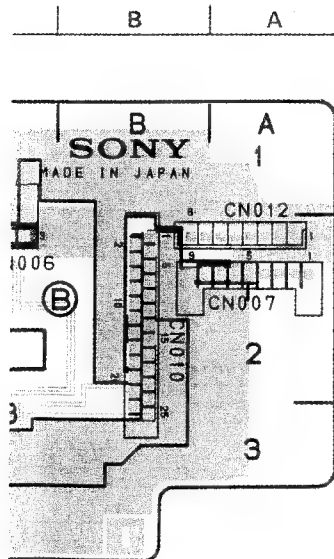
MB-363 (1-640-281-13)

CN1 D-2  
CN2 F-2  
CN3 F-1  
CN4 F-1  
CN5 F-3  
CN6 C-2  
CN7 A-2  
CN8 F-2 (B)  
CN9 G-1 (B)  
CN10 B-2  
CN11 G-2 (B)  
CN12 A-2

NOTE  
\*-\* : \*-A SIDE  
\*-(B); \*-B SIDE

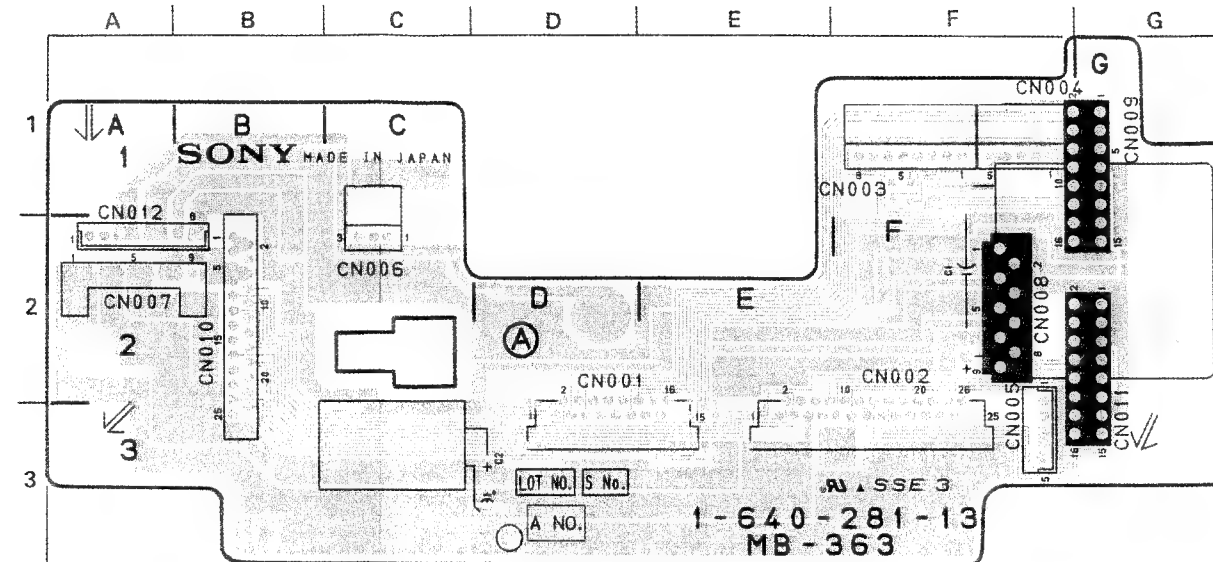


MB-363 -A SIDE-  
1-640-281-12  
PVV-1P



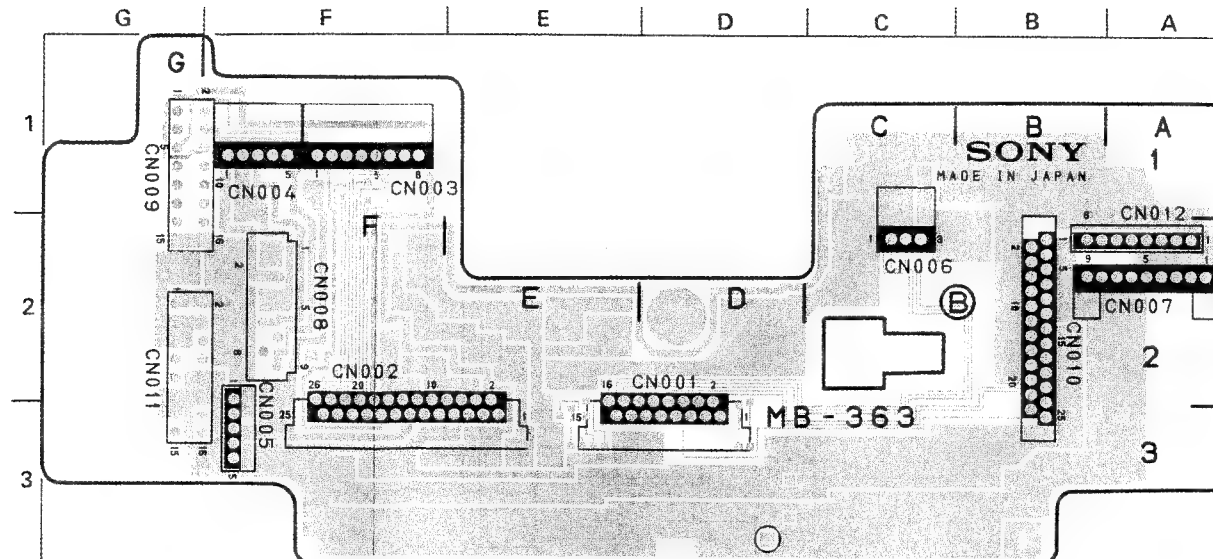
MB-363 -B SIDE-  
1-640-281-12  
PVV-1P

A Side



MB-363 -A SIDE-  
1-640-281-13  
PVV-1P

B Side



MB-363 -B SIDE-  
1-640-281-13  
PVV-1P

**MB-363 BOARD**  
Mother Board

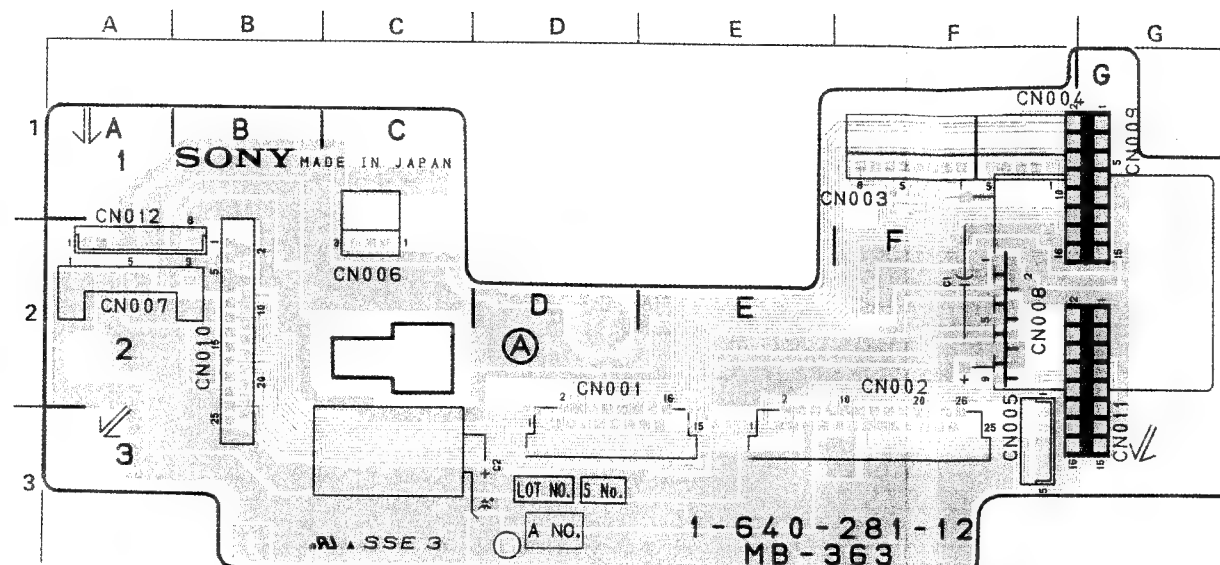
S/N 10501 through 10800

MB-363 (1-640-281-12)

- CN1 D-2
- CN2 F-2
- CN3 F-1
- CN4 F-1
- CN5 F-3
- CN6 C-2
- CN7 A-2
- CN8 F-2 (B)
- CN9 G-1 (B)
- CN10 B-2
- CN11 G-2 (B)
- CN12 A-2

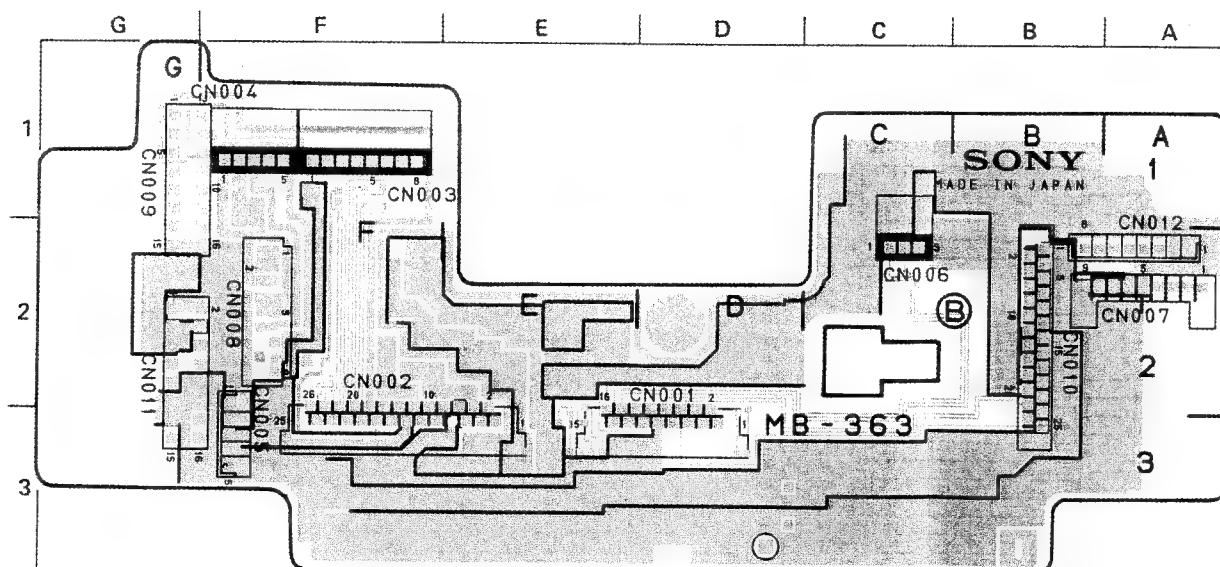
NOTE  
\*-\* : \*-\*A SIDE  
\*-(B) : \*-\*B SIDE

A Side



**MB-363 -A SIDE-**  
1-640-281-12  
PVV-1P

B Side



**MB-363 -B SIDE-**  
1-640-281-12  
PVV-1P

**MB-363 BOARD**  
Mother Board

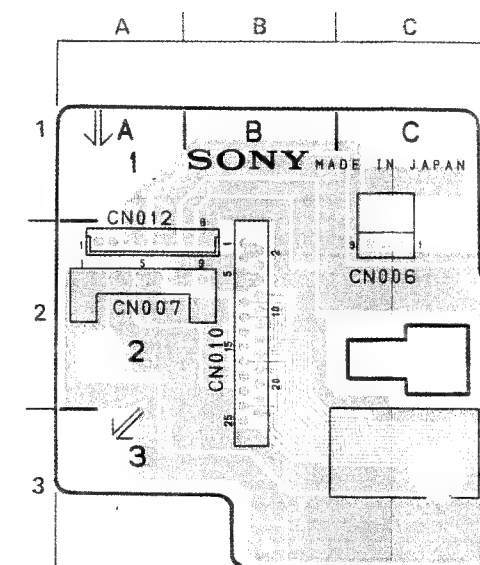
S/N 10801 through 11420

MB-363 (1-640-281-13)

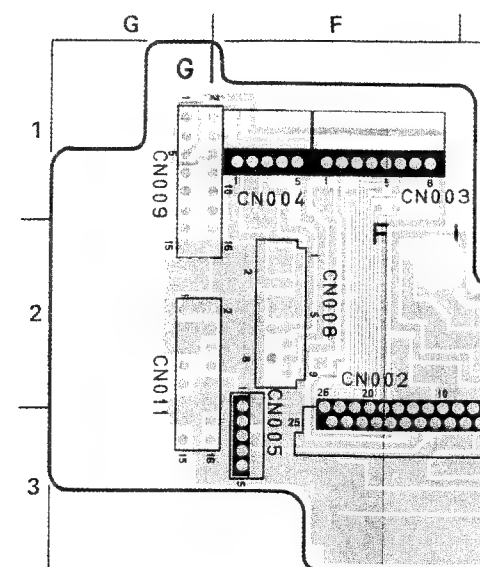
- CN1 D-2
- CN2 F-2
- CN3 F-1
- CN4 F-1
- CN5 F-3
- CN6 C-2
- CN7 A-2
- CN8 F-2 (B)
- CN9 G-1 (B)
- CN10 B-2
- CN11 G-2 (B)
- CN12 A-2

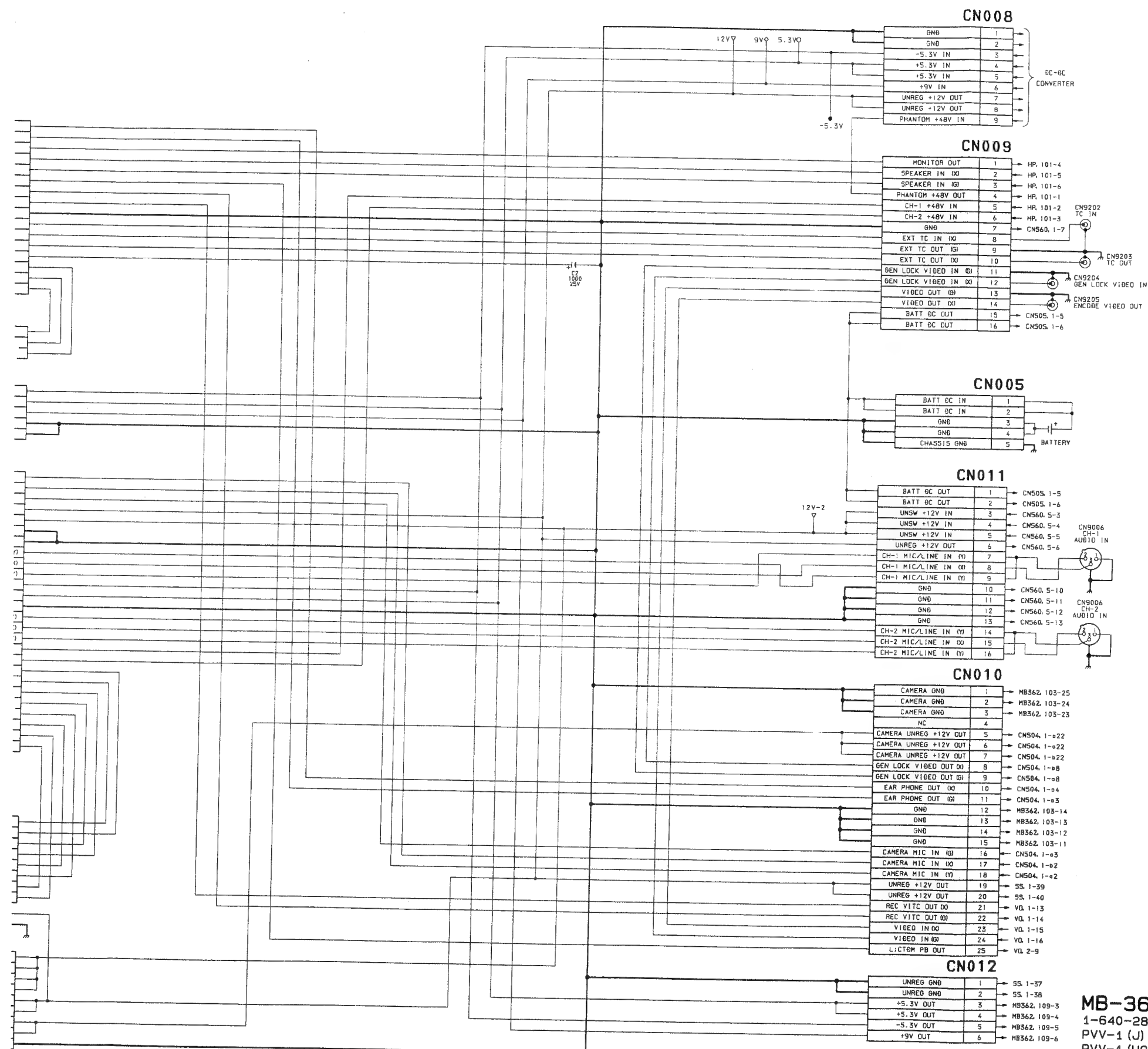
NOTE  
\*-\* : \*-\*A SIDE  
\*-(B) : \*-\*B SIDE

A Side



B Side



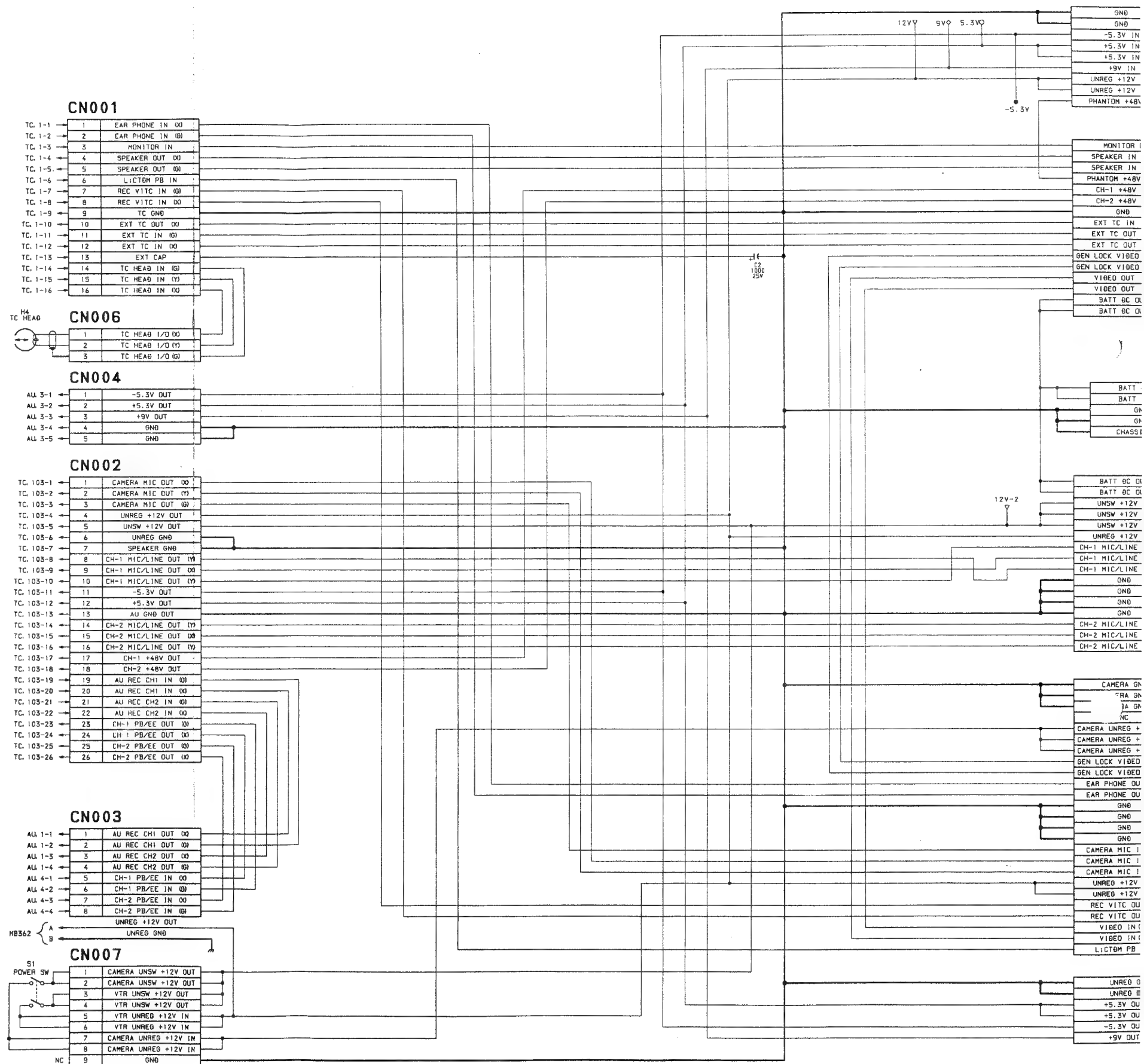


**MB-363 BOARD**  
 1-640-281-11  
 PVV-1 (J) ; #10001-10460  
 PVV-1 (UC) ; #10001-10840  
 PVV-1P (EK) ; #10001-10500

Mother Board

S/N 10001 through 10500
-------------------------

MB-363 MB-363



11-33 (a)

11-33 (a)

# H

**MB-363 BOARD**  
Mother Board

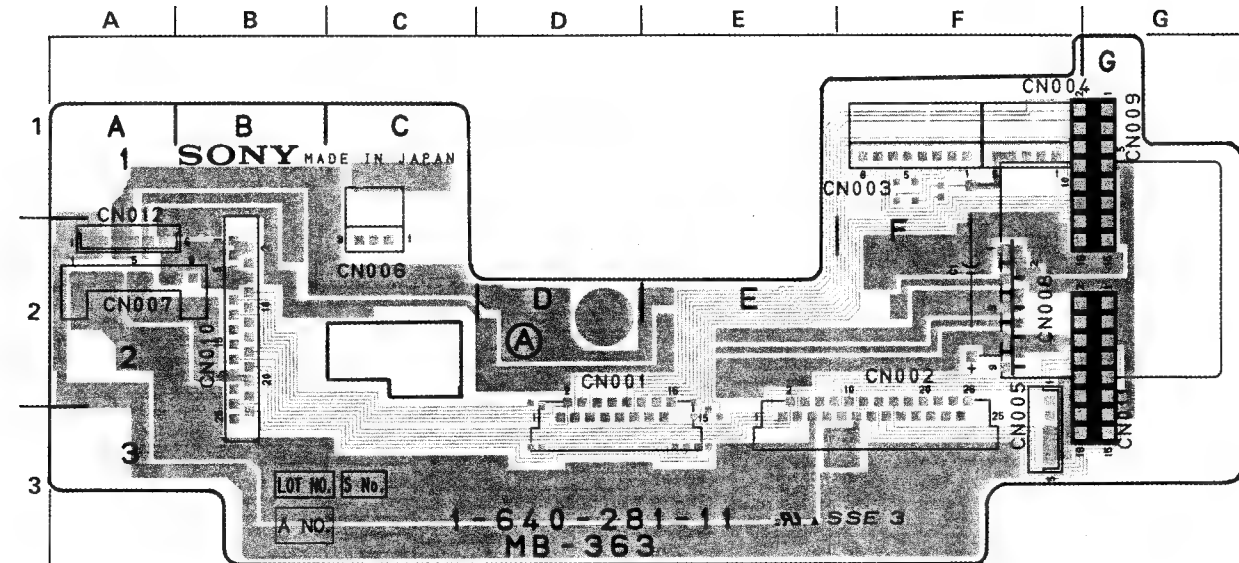
S/N 10001 through 10500

MB-363 (1-640-281-11)

- CN1 D-2
- CN2 F-2
- CN3 F-1
- CN4 F-1
- CN5 F-3
- CN6 C-2
- CN7 A-2
- CN8 F-2 (B)
- CN9 G-1 (B)
- CN10 B-2
- CN11 G-2 (B)
- CN12 A-2

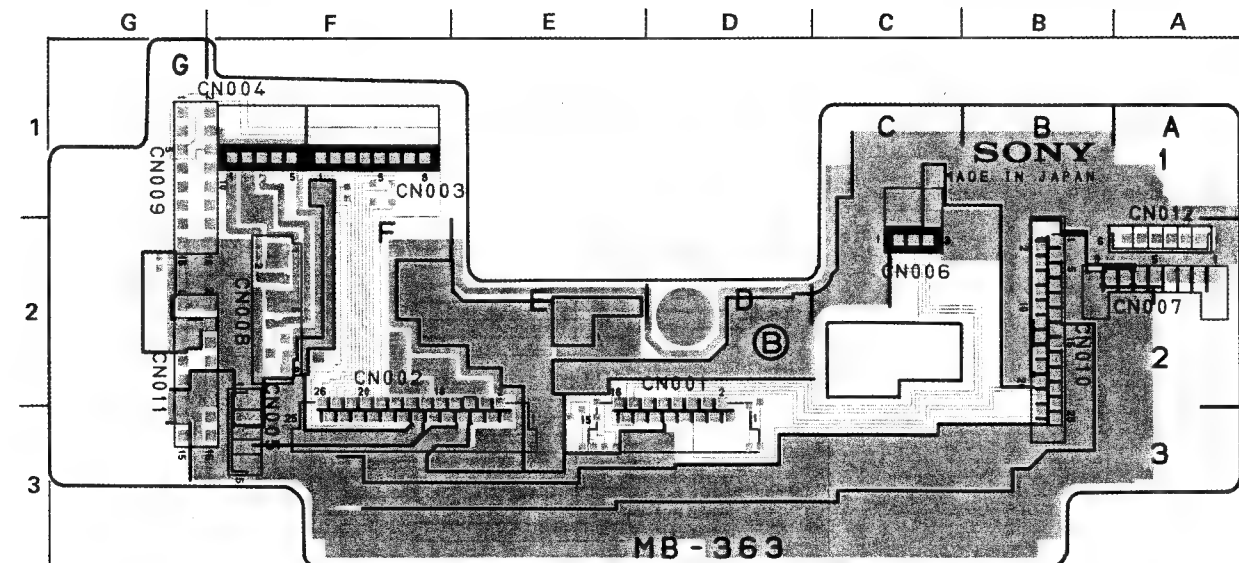
NOTE  
 \*\* : \*\*A SIDE  
 \*\* (B) : \*\*B SIDE

A Side

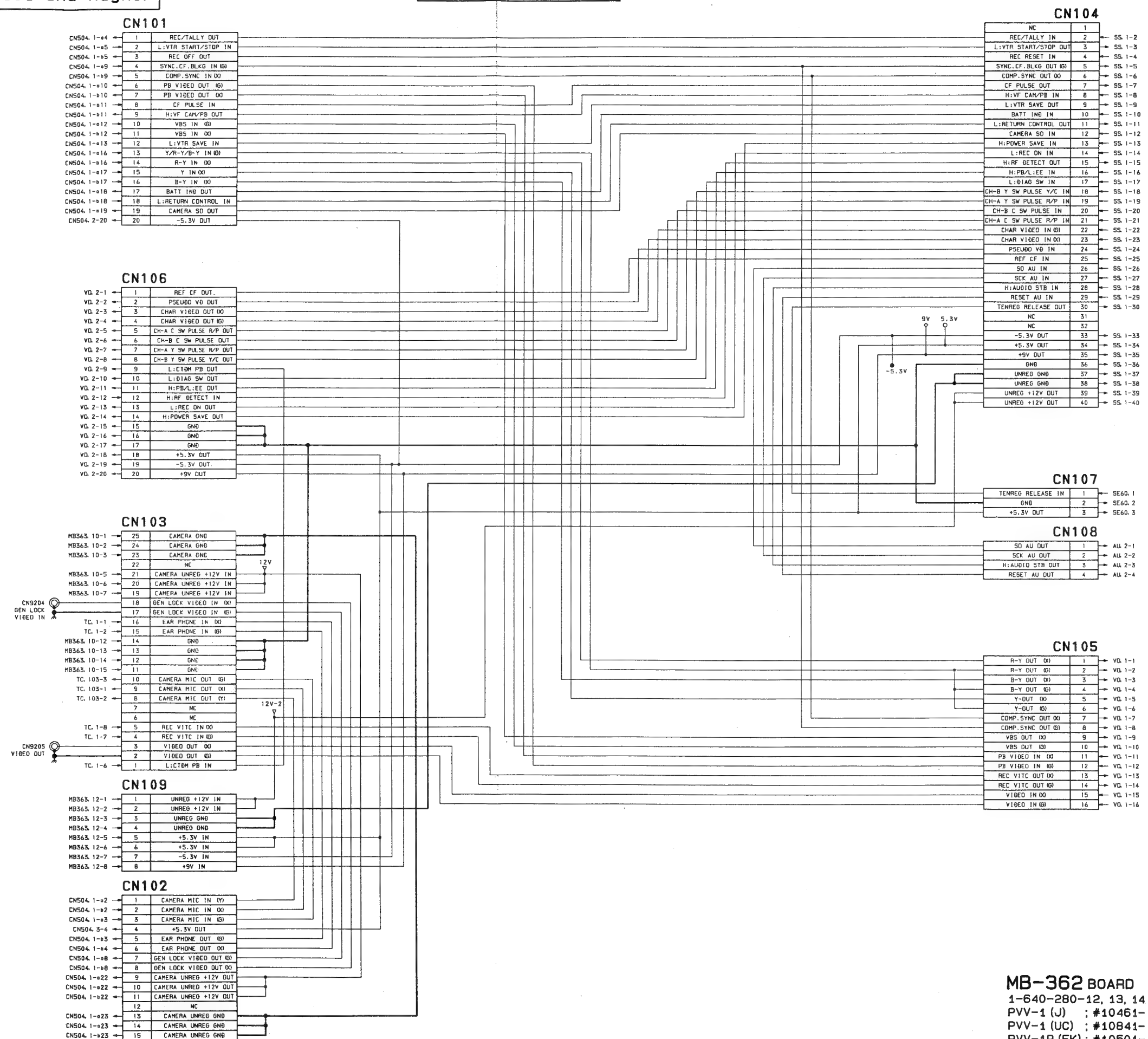


**MB-363 -A SIDE-**  
 1-640-281-11  
 PVV-1  
 PVV-1P

B Side



**MB-363 -B SIDE-**  
 1-640-281-11  
 PVV-1  
 PVV-1P





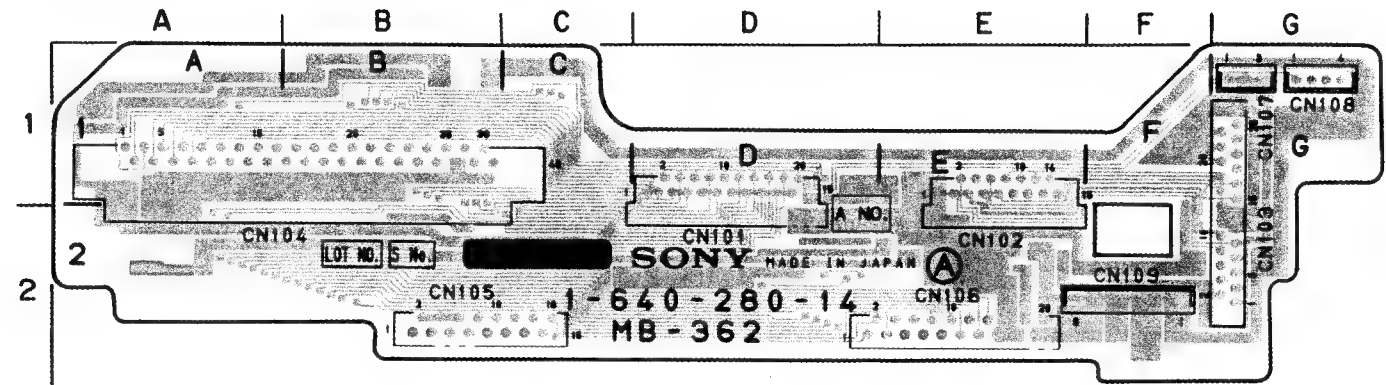
**MB-362 BOARD**  
Mother Board

S/N 11421 and higher

**MB-362 (1-640-280-14)**

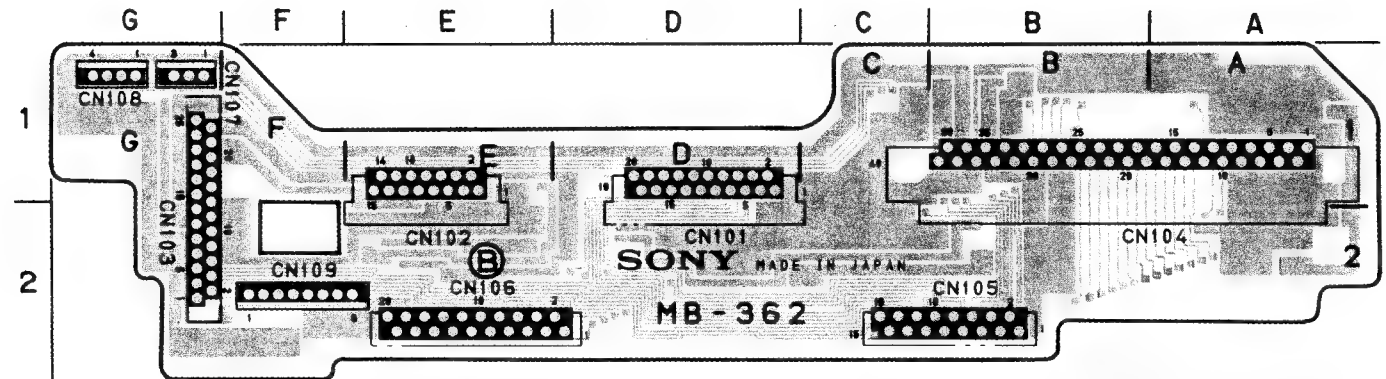
CN101 D-2  
CN102 E-2  
CN103 G-2  
CN104 B-2  
CN105 C-2  
CN106 E-2  
CN107 G-1  
CN108 G-1  
CN109 F-2

**A Side**



**MB-362 -A SIDE-**  
1-640-280-14  
PVV-1P

**B Side**



**MB-362 -B SIDE-**  
1-640-280-14  
PVV-1P



MB-362 MB-362

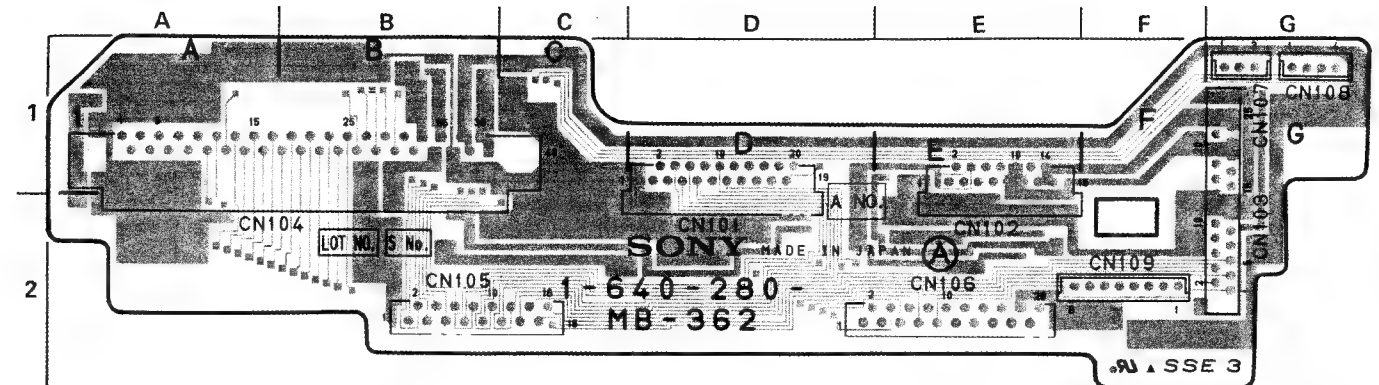
MB-362 BOARD  
Mother Board

S/N 10501 through 11420

MB-362 (1-640-280-12, 13)

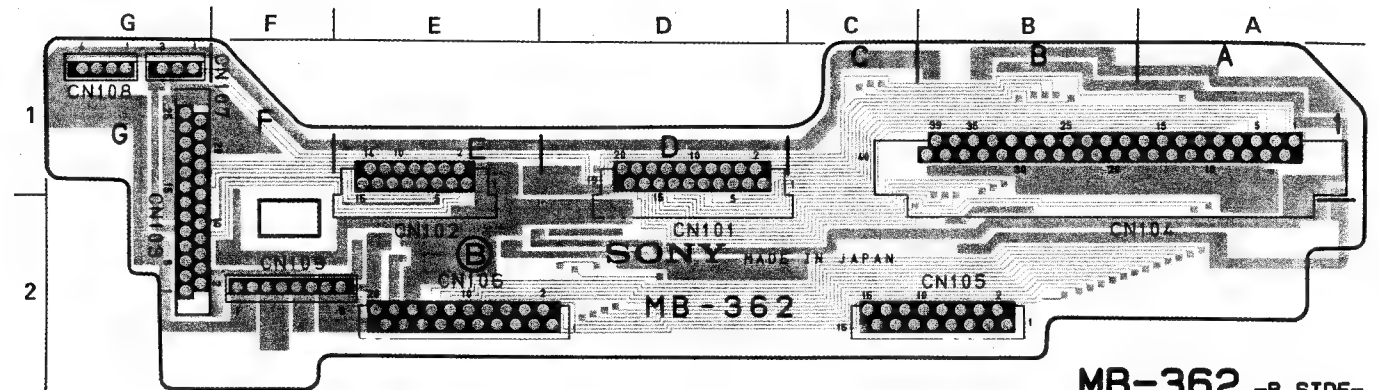
CN101 D-2  
CN102 E-2  
CN103 G-2  
CN104 B-2  
CN105 C-2  
CN106 E-2  
CN107 G-1  
CN108 G-1  
CN109 F-2

A Side

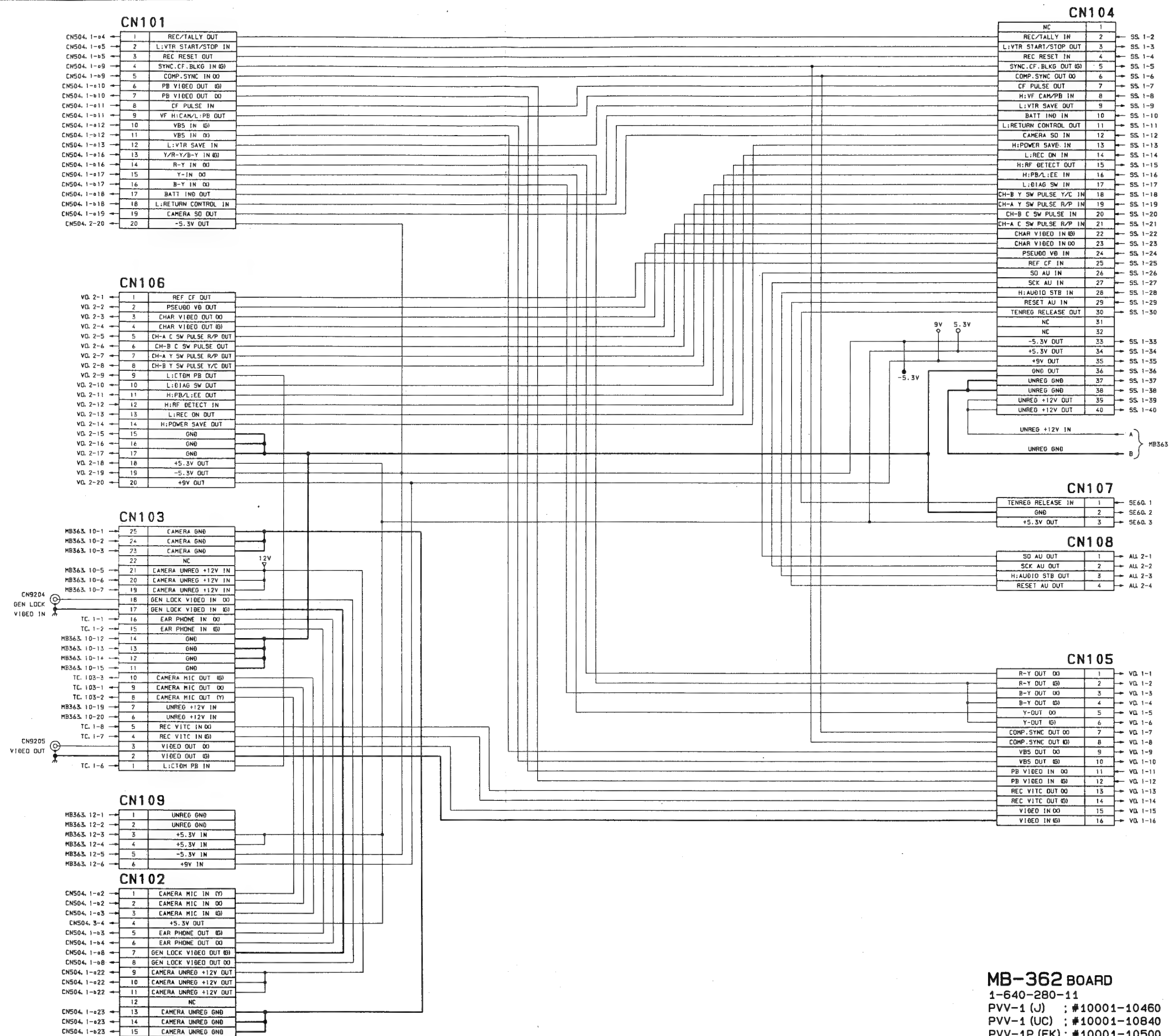


MB-362 -A SIDE-  
1-640-280-12, 13  
PVV-1P

B Side



MB-362 -B SIDE-  
1-640-280-12, 13  
PVV-1P



MB-362 BOARD  
1-640-280-11  
PVV-1 (J) : #10001-10460  
PVV-1 (UC) : #10001-10840  
PVV-1P (EK) : #10001-10500

## SECTION 12

### SEMICONDUCTOR PIN ASSIGNMENT

この章の図の中には互換性のないダイオード、トランジスタ、ICが併記されていることがあります。部品を交換するときには必ず部品表を参照してください。

等価回路はICメーカーのData Bookに従いました。

The chart in this section may sometimes show diodes, transistors, and ICs that are not interchangeable. When replacing a component, be sure to refer to the parts list.

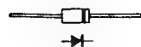
The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

DIODE	PAGE	TRANSISTOR	PAGE	IC	PAGE	IC	PAGE
10E-2 .....	12-2	2SA1255Y .....	12-3	BA6229 .....	12-4	NJM4556M-A .....	12-17
1SS123 .....	12-2	2SA1462 .....	12-3	CX20030 .....	12-4	NJM4560MD .....	12-17
1SS303 .....	12-2	2SA1611 .....	12-3	CX7991 .....	12-5	RC2041MD .....	12-17
1SS304 .....	12-2	2SB1115A .....	12-3	CXA1098Q .....	12-5	RC2043MD .....	12-17
1SV160 .....	12-2	2SB624 .....	12-3	CXA1179N .....	12-5	RC4558M .....	12-17
DA204U .....	12-2	2SB907 .....	12-3	CXA1451M .....	12-6	RH5VA30CA .....	12-17
DAN202U .....	12-2	2SC1623 .....	12-3	CXA1480Q .....	12-6	S-8054HN-CB .....	12-17
DAP202U .....	12-2	2SC2712G .....	12-3	CXD1128Q .....	12-6	S-81230AG-RB .....	12-17
EBR3402S .....	12-2	2SC2713G .....	12-3	CXD1132Q .....	12-7	SN74HC04ANS .....	12-17
ERA81-004 .....	12-2	2SC2873Y .....	12-3	CXD1151Q .....	12-8	SN74HC14ANS .....	12-17
ESAC33-02CS .....	12-2	2SC3360 .....	12-3	CXD1171M .....	12-9	TA7267P .....	12-17
GP-2S09-B .....	12-2	2SC3735 .....	12-3	CXD1175AM .....	12-9	TC4S01F .....	12-18
RD ? ? ESB ? .....	12-2	2SC4116-YG .....	12-3	CXD8042Q .....	12-12	TC4S11F .....	12-18
RD ? ? FB ? .....	12-2	2SC4177 .....	12-3	CXK1011P .....	12-13	TC4S30F .....	12-18
SB01-05CP .....	12-2	2SC4178 .....	12-3	CXP80116-845Q .....	12-10	TC4S584F .....	12-18
U05G .....	12-2	2SC4213B .....	12-3	LA7205M .....	12-13	TC4S69F .....	12-18
		2SD1164 .....	12-3	LM2901M .....	12-13	TC4S71F .....	12-18
		2SD1221 .....	12-3	LM2903M .....	12-13	TC4S81F .....	12-18
		2SD1615 .....	12-3	LM2904M .....	12-13	TC4SU69F .....	12-18
		2SD596 .....	12-3	MB88325PF .....	12-14	TC7SU04F .....	12-18
		2SJ132 .....	12-3	MC14011BF .....	12-15	TC74HC221AF .....	12-18
		2SK209G .....	12-3	MC14013BF .....	12-15	TC74HC4049AF .....	12-18
		2SK613-3 .....	12-3	MC14046BF .....	12-15	TC74HC4053AF .....	12-19
		2SK739-Z .....	12-3	MC14053BF .....	12-15	TL062CPS .....	12-19
		DTA114EU .....	12-3	MC14066BF .....	12-15	TL072CPS .....	12-19
		DTA144EU .....	12-3	MC14069UBF .....	12-15	UPC324G2 .....	12-19
		DTC114EU .....	12-3	MC14071BF .....	12-15	UPC358G2 .....	12-19
		DTC114YU .....	12-3	MC14094BF .....	12-16	UPC4572G2 .....	12-19
		DTC144EU .....	12-3	MC14538BF .....	12-16	UPC78L05T .....	12-19
				MC34182M .....	12-16	UPC78N05H .....	12-19
				NJM386M .....	12-16		
				NJM2041M-D .....	12-16		
				NJM2043M-D .....	12-16		
				NJM2903M .....	12-16		
				NJM2904M .....	12-17		

# DIODE

## DIODE

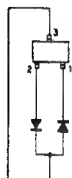
1SCALE 4/11  
TOP VIEW



10E-2



EBR3402S ; RED

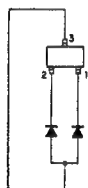


1SS123  
DA204U

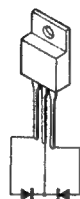


ERA81-004

1SCALE 4/11  
TOP VIEW

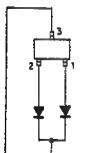


1SS303



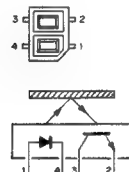
ESAC33-02CS

1SCALE 4/11  
TOP VIEW



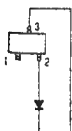
1SS304  
DAN202U

TOP VIEW (SCALE 4/11)



GP-2S09

1SCALE 4/11  
TOP VIEW

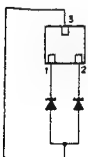


1SV160



RD ? ?ESB ?  
RD ? ?FB ?

TOP VIEW (SCALE 4/11)



DAP202U

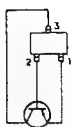


SB01-05CP



U05G

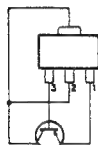
## TRANSISTOR



2SA1255Y  
2SA1462  
2SA1611  
2SB624



2SD1221



2SB1115A



2SJ132



2SB907

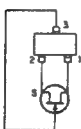


2SK739-Z

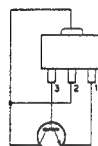


2SC1623  
2SC2712G  
2SC2713G  
2SC3360  
2SC3735  
2SC4116-YG  
2SC4177  
2SC4178  
2SD596  
2SC4213B

TOP VIEW (SCALE 4/1)

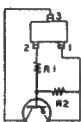


2SK209G  
2SK94  
2SK613-3

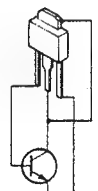


2SC2873Y  
2SD1615

TOP VIEW (SCALE 4/1)

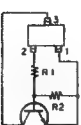


DTA114EU (R1 = 10K, R2 = 10K)  
DTA144EU (R1 = 47K, R2 = 47K)



2SD1164

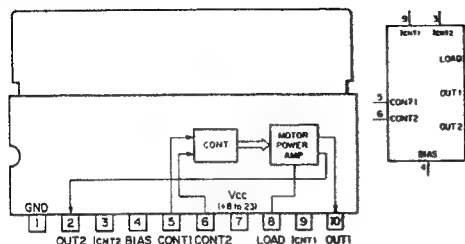
TOP VIEW (SCALE 4/1)



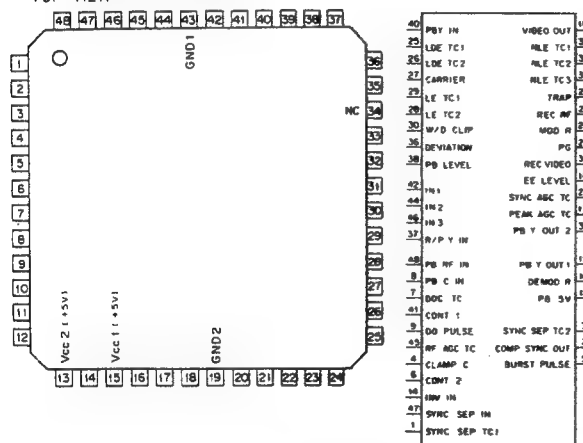
DTC114EU (R1 = 10K, R2 = 10K)  
DTC114YU (R1 = 10K, R2 = 47K)  
DTC144EU (R1 = 47K, R2 = 47K)

IC

BA6229 (ROHM)  
BI-DIRECTIONAL MOTOR DRIVER  
- SIDE VIEW -



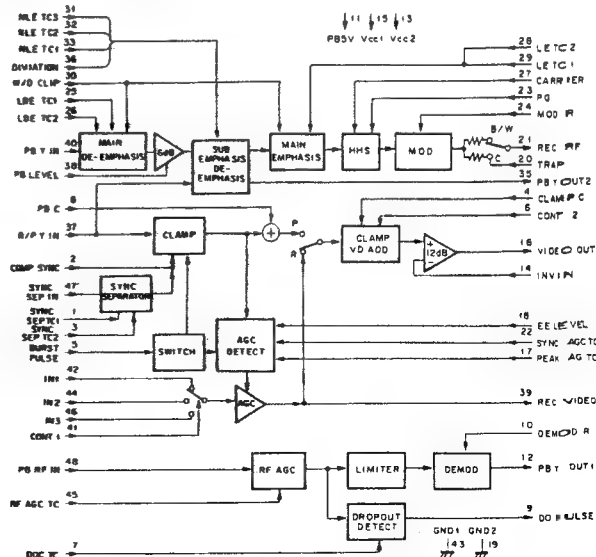
CX20030 (SONY) FLAT PACKAGE  
VIDEO Y SIGNAL PROCESSOR  
- TOP VIEW -

(V<sub>DD</sub> = +5V)

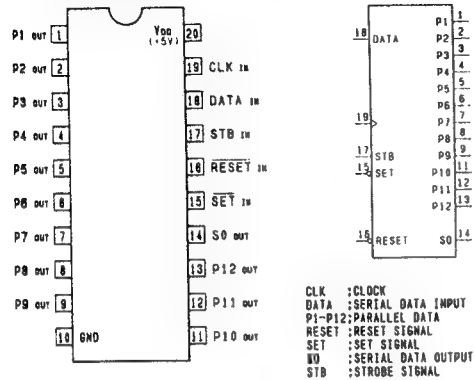
PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL
1	I	SYNC SEP TC1	17	I	PEAK AGC TC	33	I	NLE TC1
2	O	COMP SYNC	18	I	EE LEVEL	34	-	NC
3	I	SYNC SEP TC2	19	-	GND2	35	O	PB Y OUT2
4	I	CLAMP C	20	I	TRAP	36	I	DEVIATION
5	I	BURST PULSE	21	O	REC RF	37	I	R/P Y IN
6	I	CONT2	22	I	SYNC AGC TC	38	I	PB LEVEL
7	I	DOC TC	23	I	PG	39	O	REC VIDEO
8	I	PB C	24	I	MOD R	40	I	PB Y IN
9	O	DO PULSE	25	I	LDE TC1	41	I	CONT1
10	I	DEM0D R	26	I	LDE TC2	42	I	IN1
11	I	PB SV	27	I	CARRIER	43	-	GND1
12	O	PB Y OUT1	28	I	LE TC2	44	I	IN2
13	-	Vcc2	29	I	LE TC1	45	I	RF AGC TC
14	I	INV IN	30	I	W/D CLIP	46	I	IN3
15	-	Vcc1	31	I	NLE TC3	47	I	SYNC SEP IN
16	O	VIDEO OUT	32	I	NLE TC2	48	I	PB RF IN

**INPUT**  
BURST PULSE : BURST PULSE INPUT  
CARRIER : FM MODULATOR CARRIER CONTROL INPUT  
CLAMP C : EXTERNAL CAPACITOR FOR CLAMPING INPUT  
CONT 1 : INTERNAL SWITCH CONTROL INPUT  
CONT 2 : MUTING AND VD-ADD CONTROL INPUT  
DEM0D R : EXTERNAL RESISTOR FOR FM DEMODULATOR INPUT  
DEVIATION : DEVIATION CONTROL INPUT  
DOC TC : EXTERNAL CAPACITOR FOR DROPOUT DETECTION INPUT  
EE LEVEL : SYNC AGC CONTROL INPUT  
INV IN : RECORDING VIDEO SIGNAL INPUT  
IN1 - IN3 : INVERTING INPUT FOR VIDEO CIRCUIT  
LDE TC1,TC2 : EXTERNAL RESISTOR FOR LINEAR DE-EMPHASIS INPUTS  
LE TC1,TC2 : EXTERNAL CR FOR LINEAR EMPHASIS INPUTS  
MOD R : EXTERNAL RESISTOR FOR FM MODULATOR INPUT  
NLE TC1 - NLE TC3 : EXTERNAL CAPACITOR FOR NON-LINEAR EMPHASIS INPUTS  
PB SV : POWER FOR PLAYBACK SYSTEM INPUT  
PB C : PB CHROMA INPUT AND M/C CONTROL INPUT  
PB LEVEL : PB Y OUT2 SIGNAL CONTROL INPUT  
PB RF IN : PB RF (FM) INPUT  
PB Y IN : PB Y SIGNAL FOR DEEMPHASIS INPUT  
PEAK AGC TC : EXTERNAL CR INPUT FOR PEAK AGC  
PG : PG (30Hz) SIGNAL INPUT  
RF AGC TC : EXTERNAL CR FOR RF AGC INPUT  
R/P Y IN : Y SIGNAL FOR CLAMPING INPUT  
SYNC AGC TC : EXTERNAL CR INPUT FOR SYNC AGC  
SYNC SEP IN : SYNC SEPARATION SIGNAL INPUT  
SYNC SEP TC1,TC2 : EXTERNAL CR INPUT FOR SYNC SEPARATION  
TRAP : TRAP INPUT  
W/D CLIP : LINEAR EMPHASIS AND W/D CLIP CONTROL INPUT

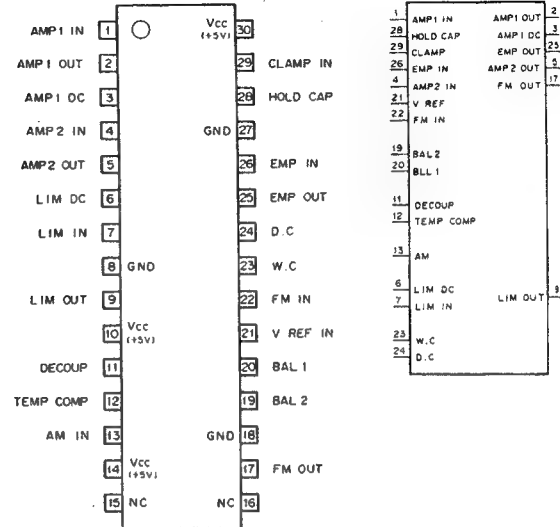
**OUTPUT**  
COMP SYNC : COMPOSITE SYNC OUTPUT  
DO PULSE : DROPOUT PULSE OUTPUT  
PB Y OUT1 : FREQUENCY DEMODULATOR OUTPUT  
PB Y OUT2 : PB Y OUTPUT  
REC RF : Y-FM SIGNAL OUTPUT  
REC VIDEO : AMPLIFIED Y SIGNAL OUTPUT  
VIDEO OUT : VIDEO OUTPUT



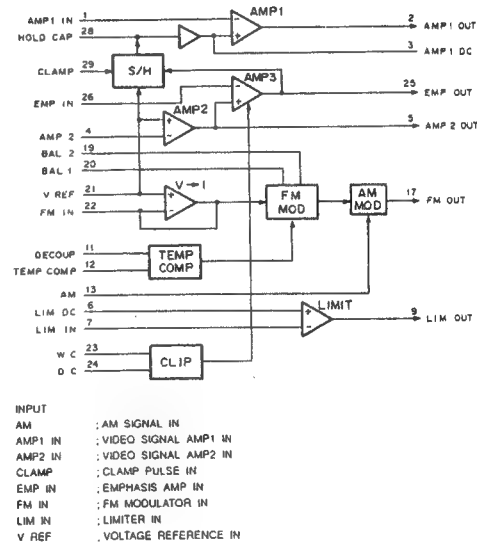
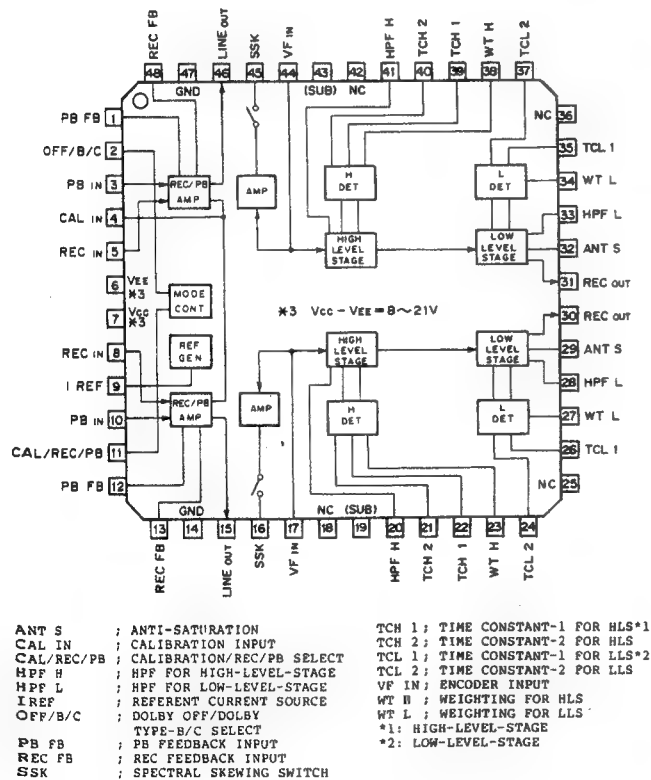
CX7991 (SONY)  
C-MOS 12-BIT SERIAL TO PARALLEL CONVERTER  
- TOP VIEW -



CXA1179N (SONY)  
VIDEO Y/C REC FM MODULATOR FOR BETACAM  
- TOP VIEW -



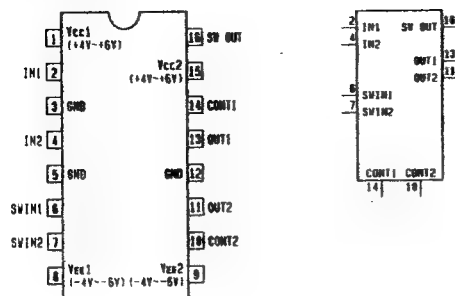
CXA1098Q (SONY) FLAT PACKAGE  
2 CHANNELS DOLBY TYPE-B/C NOISE REDUCTION  
- TOP VIEW -



ANT S : ANTI-SATURATION  
CAL IN : CALIBRATION INPUT  
CAL/REC/PB : CALIBRATION/REC/PB SELECT  
HPF H : HPF FOR HIGH-LEVEL-STAGE  
HPF L : HPF FOR LOW-LEVEL-STAGE  
I REF : REFERENCE CURRENT SOURCE  
OFF/B/C : DOLBY OFF/DOLBY  
TYPE-B/C SELECT  
PB FB : PB FEEDBACK INPUT  
REC FB : REC FEEDBACK INPUT  
SSK : SPECTRAL SKEWING SWITCH  
TCH 1 : TIME CONSTANT-1 FOR HLS\*1  
TCH 2 : TIME CONSTANT-2 FOR HLS  
TCL 1 : TIME CONSTANT-1 FOR LLS\*2  
TCL 2 : TIME CONSTANT-2 FOR LLS  
VF IN : ENCODER INPUT  
WT H : WEIGHTING FOR HLS  
WT L : WEIGHTING FOR LLS  
\*1: HIGH-LEVEL-STAGE  
\*2: LOW-LEVEL-STAGE

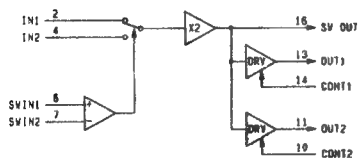
INPUT  
AM : AM SIGNAL IN  
AMP1 IN : VIDEO SIGNAL AMP1 IN  
AMP2 IN : VIDEO SIGNAL AMP2 IN  
CLAMP : CLAMP PULSE IN  
EMP IN : EMPHASIS AMP IN  
FM IN : FM MODULATOR IN  
LIM IN : LIMITER IN  
V REF : VOLTAGE REFERENCE IN  
OUTPUT  
AMP1 OUT : VIDEO SIGNAL AMP1 OUT  
AMP2 OUT : VIDEO SIGNAL AMP2 OUT  
EMP OUT : EMPHASIS AMP OUT  
FM OUT : FM MODULATOR OUT  
LIM OUT : LIMITER OUT  
OTHER  
BAL1, BAL2 : MODULATOR BALANCE ADJUSTMENT  
D.C : DARK CLIP ADJUSTMENT  
DECOUP : DECOUPLING CAPACITOR  
HOLD CAP : HOLD CAPACITOR  
LIM DE : LIMITER DECOUPLING CAPACITOR  
TEMP COMP : TEMPERATURE COMPENSATION  
W.C : WHITE CLIP ADJUSTMENT  
AMP1 DC : AMP1 CLAMP DC

## CXA1451M (SONY)

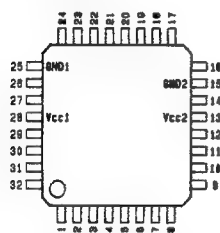
WIDEBAND VIDEO SWITCH  
- TOP VIEW -

INPUT  
CONT1, 2 : POWER SAVE CONTROL PIN OF DRV.1 AND DRV.2  
INT1, 2 : 1/2 CHANNEL INPUT PIN  
SWIN1, 2 : IN1/IN2 PINS SWITCH CONTROL PIN

OUTPUT  
OUT1, 2 : OUTPUT PIN OF DRV.1/2  
SVOUT : OUTPUTS IN1 PIN OR IN2 PIN WHICH HAS BEEN SELECTED BY SWITCH.

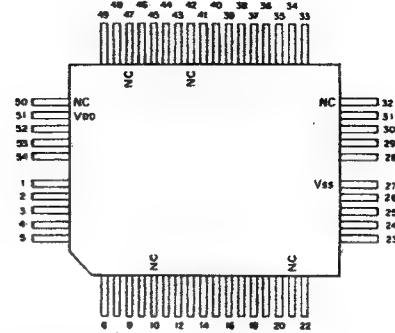


## CXA1480Q (SONY)

THROUGH RATE LIMITER  
- TOP VIEW -

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	I	TH IN	17	O	SRL OUT
2	I	SRL CONT	18	I	SRL IN
3	I	SRL C	19	I	SR R IN
4	I	SRL REF	20	O	SR R OUT
5	I	LIM H	21	O	VCA OUT
6	I	LIM L	22	I	RG1 IN
7	I	SW IN2	23	O	RG1 OUT
8	I	SH IN	24	O	AMP OUT
9	O	SH C	25	-	GND1
10	O	SH OUT	26	I	AMP IN
11	I	SH PLS	27	I	AMP REF
12	I	SW PLS	28	-	Vcc1
13	-	Vcc2	29	I	RG2 IN
14	O	SW OUT	30	I	VCA CONT
15	-	GND2	31	O	COMP OUT
16	I	SW IN1	32	O	COMP SIG

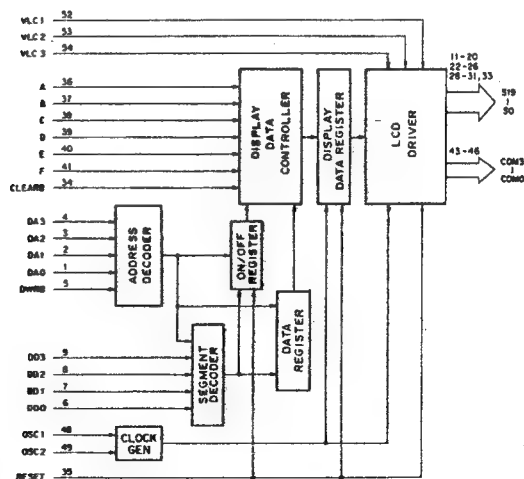
## CXD1128Q (SONY) FLAT PACKAGE

C-MOS LCD CONTROLLER/DRIVER  
- TOP VIEW -

PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL
1	I	DA0	19	O	S6	37	I	B
2	I	DA1	20	O	S9	38	I	C
3	I	DA2	21	-	NC	39	I	D
4	I	DA3	22	O	S10	40	I	E
5	I	DWRB	23	O	S11	41	I	F
6	I	DD0	24	O	S12	42	-	NC
7	I	DD1	25	O	S13	43	O	COM0
8	I	DD2	26	O	S14	44	O	COM1
9	I	DD3	27	-	Vss	45	O	COM2
10	-	NC	28	O	S15	46	O	COM3
11	O	S0	29	O	S16	47	-	NC
12	O	S1	30	O	S17	48	I	OSC1
13	O	S2	31	O	S18	49	O	OSC2
14	O	S3	32	-	NC	50	-	NC
15	O	S4	33	O	S19	51	-	Vss
16	O	S5	34	I	CLEARB	52	I	VLC1
17	O	S6	35	I	RESET	53	I	VLC2
18	O	S7	36	I	A	54	I	VLC3

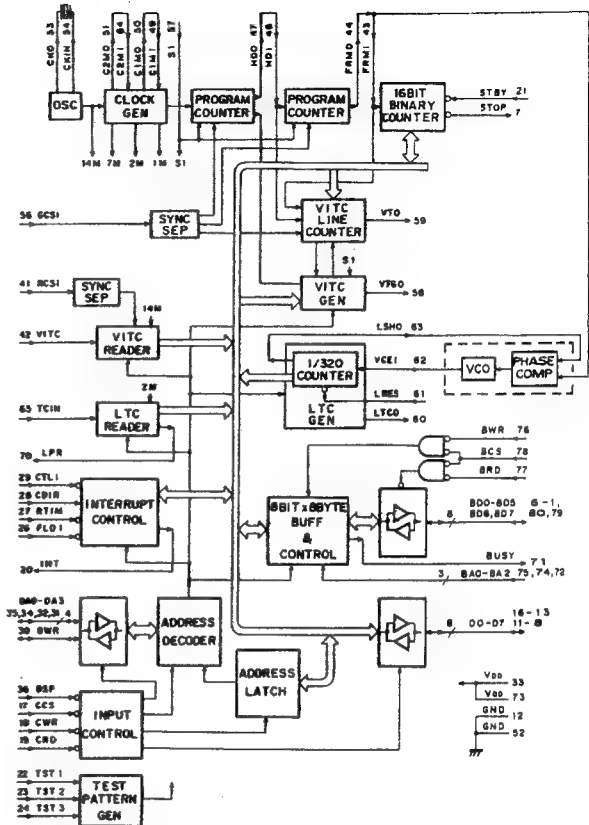
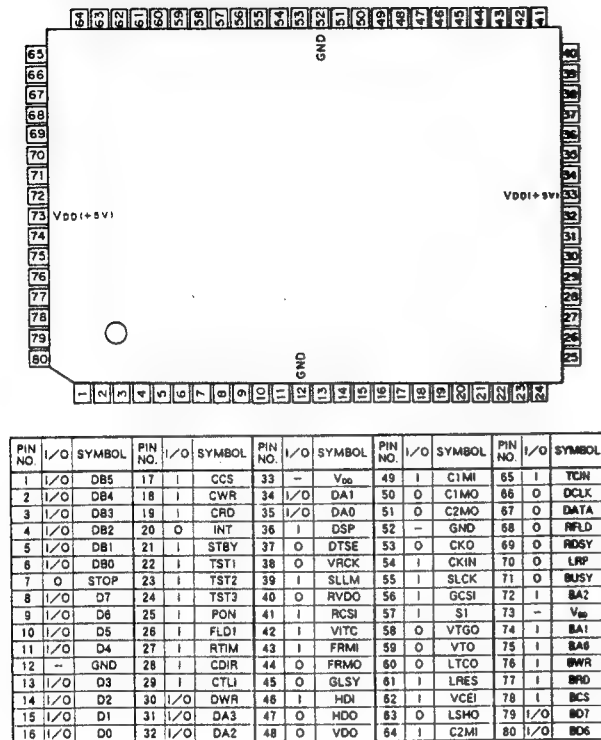


A-F : STATUS INPUT  
COM0-3 : LCD COMMON OUTPUTS  
CLEARB :  
DA0-3 : ADDRESS INPUTS  
DD0-3 : DATA INPUTS  
DWRB : WRITE PULSE INPUT  
OSC1,2 : CR ELEMENT  
RESET : RESET PULSE INPUT  
S19-0 : LCD SEGMENT OUTPUTS  
VLC3-1 :





CXD1132Q (SONY) FLAT PACKAGE  
C-MOS TIME CODE GENERATOR/READER  
- TOP VIEW -



SIGNAL DESCRIPTION

BA0-BA2

B ADDRESS INPUTS

BCS B CHIP ENABLE INPUT ("L":ENABLE)

BD0-BD7

B DATA I/O

BRD B READ INPUT ("L":READ)

BUSY B BUSY OUTPUT

BWR B WRITE INPUT ("L":WRITE)

C1MI SYSTEM CLOCK INPUT

C1MO CLOCK 1 OUTPUT (CKIN x 1/16)

C2MI LTC READ CLOCK INPUT

C2MO CLOCK 2 OUTPUT (CKIN x 1/8)

CCS C CHIP ENABLE INPUT ("L":ENABLE) (when DSP is low)

ADDRESS LATCH ENABLE INPUT ("L":ENABLE) (when DSP is high)

CDIR CTL DIRECTION INPUT

CKIN SYSTEM CLOCK INPUT

VIDEO SIGNAL FORMAT		CKIN
SMPTE 29.97HZ 525LINE		14.318MHZ
EBU 25HZ 625LINE		14.500MHZ

CKO CLOCK OUTPUT

CRD C READ INPUT ("L":READ)

CTL1 CTL SIGNAL INPUT

CWR C WRITE INPUT ("L":WRITE)

D0-D7 DATA I/O (when DSP is low)/

ADDRESS INPUTS

DA0-DA3

D ADDRESS INPUTS (when DSP is high)

D ADDRESS OUTPUT (when DSP is low)

DATA DEMODULATED SERIAL DATA OUTPUT

DCLK DEMODULATED CLOCK OUTPUT

DSP DISPLAY BUS SELECT INPUT

DSP controls CCS, DA0-DA3 and DVR.

DTSE VITC DATA SEARCH FLAG OUTPUT

DWR WRITE ENABLE OUTPUT ("L":ENABLE) (when DSP is low)

D ADDRESS 4 INPUT (when DSP is high)

EA4 ADDRESS BUS INPUT

FLD1 FIELD REFERENCE INPUT ("L":FILD 1)

FRMI FRAME SIGNAL INPUT

FRMO FRAME SIGNAL OUTPUT

GCSI COMPOSITE SYNC INPUT

GLSY LOST SYNC FLAG OUTPUT

HDI HORIZONTAL SYNC INPUT

HDO HORIZONTAL SYNC OUTPUT

INT INTERRUPT REQUEST OUTPUT

LPR LTC READ REQUEST OUTPUT

LRES LTC COUNTER RESET INPUT ("L":RESET)

LSHO SYNCHRONOUS SIGNAL OUTPUT

LTCO LTC SIGNAL OUTPUT

PON SYSTEM RESET INPUT ("L":PON)

RCSI COMPOSITE SYNC INPUT

RDSY READ SYNC WORD DATA OUTPUT

RESS RESET INPUT ("L":RTIN)

RFLD FIELD DATA OUTPUT

RTIM TIME ADDRESS RESET INPUT ("L":RESET)

VITC VITC READ DATA OUTPUT

SI SIGNAL FORMAT SELECT INPUT

"H":NTSC/PAL-M 29.94HZ 525LINE

"L":PAL/SECAM 25HZ 625LINE

SLCK SELECT CLOCK INPUT

SLCK	"L"	"H"
CKIN	14.318MHZ	14.5MHZ
SMPTE	14.5MHZ	14.5MHZ
SMPTE	14.5MHZ	14.5MHZ

SLLM READ SIZE SELECT INPUT

STBY STANDBY READ FLAG INPUT

STOP STOP OUTPUT ("L":STOP)

TCIN LONGITUDINAL TIME AND CONTROL CODE INPUT

TST1-TST3 TEST INPUT

VCEI LTC CLOCK INPUT

VDO HORIZONTAL SYNC DRIVE OUTPUT

VITC VITC SIGNAL INPUT

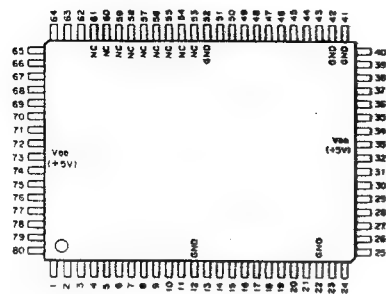
VTGO VITC GATE SIGNAL OUTPUT

VTO VITC SIGNAL OUTPUT ("H":VITC)

CXD1151Q (SONY)

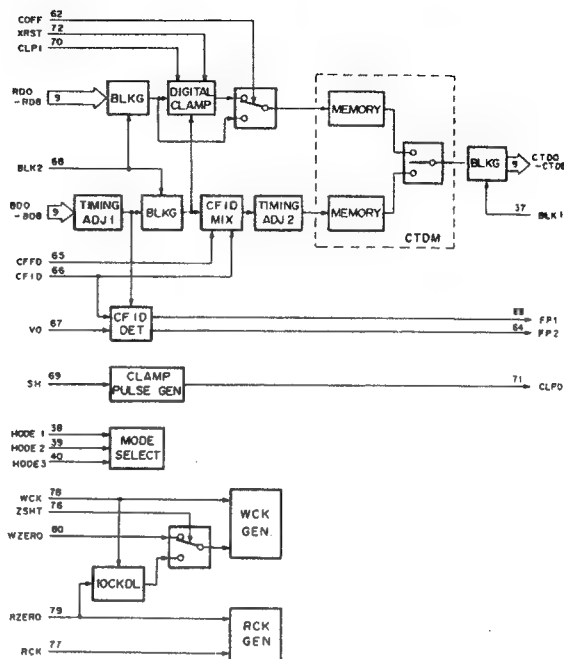
C-MOS VIDEO SIGNAL PROCESSOR FOR BETACAM  
- TOP VIEW -

- TOP VIEW -



### PIN ASSIGNMENT

PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL
1	I	R00	21	I	B08	41		NC	61		NC
2	I	R01	22		Vss (GND)	42		Vss (GND)	62	I	COFF
3	I	RD2	23	O	TM0	43	O	CTB0	63	I	FP1
4	I	RD3	24	O	TM1	44	O	CTD1	64	I	FP2
5	I	RD4	25	O	TM2	45	O	CTD2	65	I	OFF0
6	I	RD5	26	O	TM3	46	O	CTD3	66	I	CFID
7	I	RD6	27	O	TM4	47	O	CTD4	67	I	Y0
8	I	RD7	28	O	TM5	48	O	CTD5	68	I	BLK2
9	I	RD8	29	O	TM6	49	O	CTD6	69	I	SH
10	I	TSL2	30	O	TM7	50	O	CTD7	70	I	CLP1
11	I	TSL3	31	O	TM8	51	O	CTD8	71	O	CLP0
12		Vss (GND)	32	O	TM9	52		Vss (GND)	72	I	XRST
13	I	B00	33	I	Vss(+5V)	53	NC	NC	73	I	Vst(+5V)
14	I	B01	34	I	TM00	54	NC	NC	74	I	TSI1
15	I	B02	35	I	TMEN	55	NC	NC	75	I	TSI2
16	I	RD3	36	I	TSL1	56	NC	NC	76	I	ZSH1
17	I	B04	37	I	BLK1	57	NC	NC	77	I	ACK
18	I	B05	38	I	MODE1	58	NC	NC	78	I	WCK
19	I	B06	39	I	MODE2	59	NC	NC	79	I	RZERO
20	I	RD7	40	I	MODE3	60	NC	NC	80	I	WZERO



1	R00	CT00	43	R00-R08	:R-Y DATA INPUTS
2	RD1	CT01	44	B00-B08	:B-Y DATA INPUTS
3	RD2	CT02	45		:DIGITAL CLAMP CIRCUIT CONTROL INPUT
4	RD3	CT03	46		:DIGITAL CLAMP CIRCUIT RESET PULSE INPUT
5	RD4	CT04	47		:DIGITAL CLAMP CIRCUIT PULSE INPUT FOR DIGITAL CLAMP
6	RD5	CT05	48		:CLAMP PULSE INPUT FOR COLOR FRAMING ID MIX
7	RD6	CT06	49		:PULSE INPUT FOR COLOR FRAMING ID MIX
8	RD7	CT07	50		:COLOR FRAMING DETECT CIRCUIT RESET PULSE INPUT
9	RD8	CT08	51		:TRIGGER INPUT FOR CLPO OUTPUT
10				BLK1, BLK2	:BLK-Y INPUTS
11				TSL1	:MEMORY SELECT INPUT IN TEST MODE
12				TSL2, TSL3	:TEST INPUTS
13	B00	FP1	63	TMO0	:TEST MODE CONTROL INPUT
14	BD1	FP2	64	TMEN	:MEMORY ADD CIRCUIT INPUT IN TEST MODE
15	BD2	CLPO	71	TS1, TS2	:DIGITAL CLAMP CIRCUIT TEST CONTROL INPUTS
16	BD3			WCK	:WRITE CLOCK INPUT $\overline{L}$
17	BD4	TMO	23	RCK	:READ CLOCK INPUT $\overline{L}$
18	BD5	TMI	24	WZRO	:WRITE ZERO INPUT $\overline{L}$
19	BD6	TMO2	25	RZRO	:READ ZERO INPUT $\overline{L}$
20	BD7	TMI3	26	ZSHT	:INTERNAL/EXTERNAL WZERO SELECT INPUT
21	BD8	TMI4	27	CTD0-CTD8	:CTDM DATA OUTPUTS
22				TMO5	:COLOR FRAMING DETECT PULSE OUTPUTS
23	COFF	TMI6	29	CLPO	:CLAMP PULSE OUTPUT
24	XRST	TMI7	30	TMO-TMO0	:DIGITAL CLAMP CIRCUIT TEST SIGNAL OUTPUTS
25	CP1	TMI8	31		:MODE1-MODE3; MODE SELECT INPUTS
26	CFD	TMI9	32		

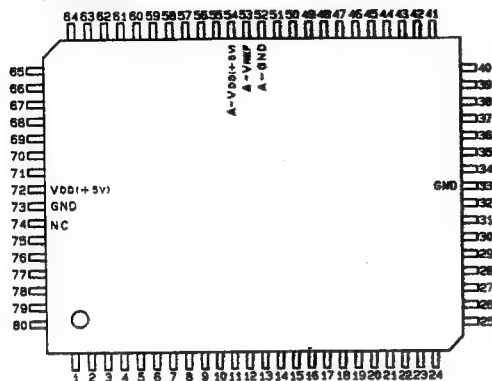
MODE1	1				1			
MODE2	1				0			
MODE3	1	0	1	0	1	0	1	0
pin	940fn	858fn	909fn	X	908fn	864fn	1336n	TCLR

0: LOW LEVEL / 1: HIGH LEVEL

0: LOW LEVEL / 1: HIGH LEVEL



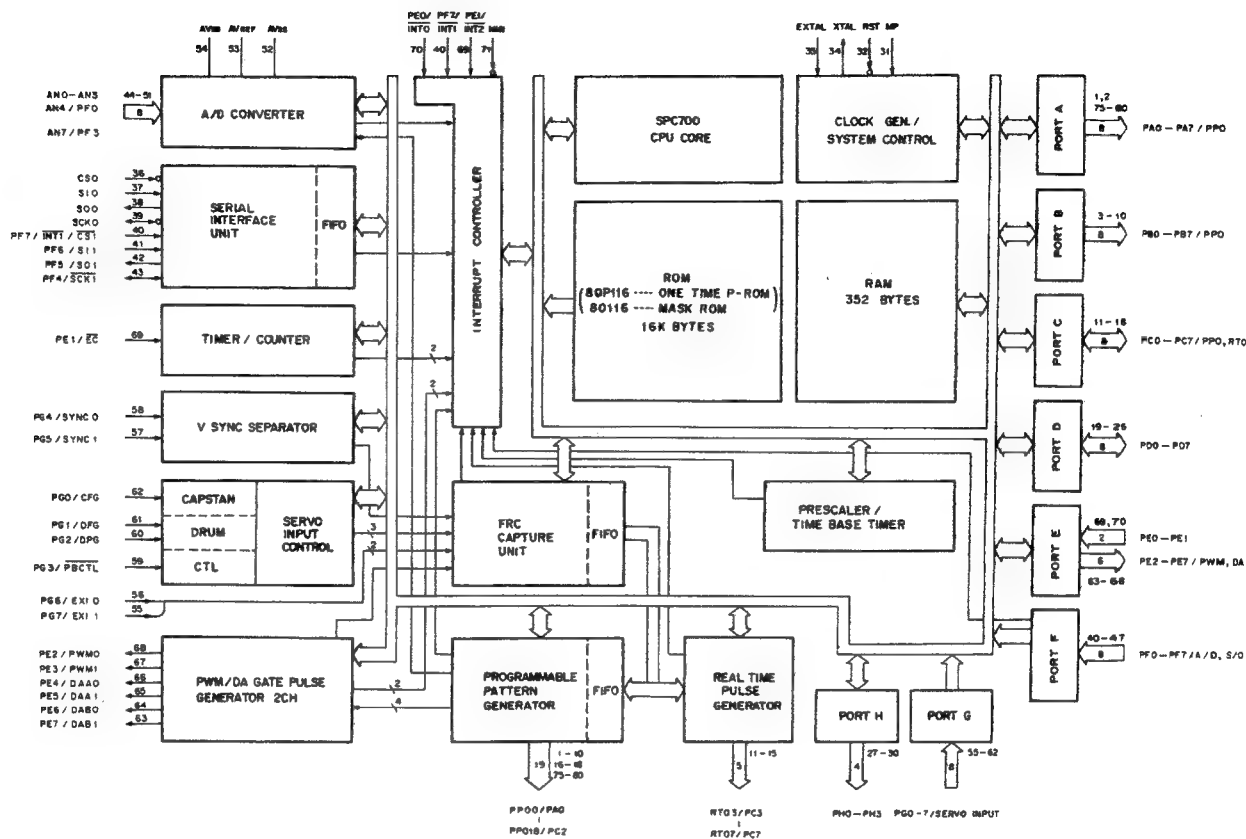
CXP80116-845Q (SONY)  
C-MOS 8-BIT MICROCOMPUTER  
- TOP VIEW -



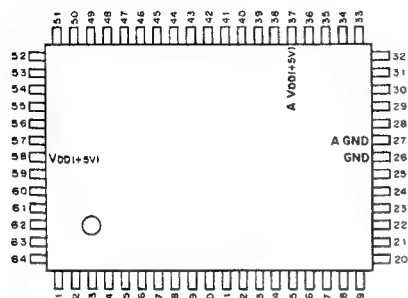
(V<sub>DD</sub> = +5V)

PIN NO.	IO	SYMBOL	PIN NO.	IO	SYMBOL
1	O	PA1/PP01A9	41	I	PF6/S1
2	O	PA0/PP00A8	42	IO	PF5/S0
3	O	PB7/PP015A7	43	IO	PF4/SCK1
4	O	PB6/PP014A6	44	I	PF3/AN7
5	O	PB5/PP013A5	45	I	PF2/AN6
6	O	PB4/PP012A4	46	I	PF1/AN5
7	O	PB3/PP011A3	47	I	PF0/AN4
8	O	PB2/PP010A2	48	I	AN3
9	O	PB1/PP009A1	49	I	AN2
10	O	PB0/PP008A0	50	I	AN1
11	I/O, O, I/O	PC7/RT07/D7	51	I	AN0
12	I/O, O, I/O	PC6/RT06/D6	52	-	A-GND
13	I/O, O, I/O	PC5/RT05/D5	53	-	A-VREF
14	I/O, O, I/O	PC4/RT04/D4	54	-	A-VDD
15	I/O, O, I/O	PC3/RT03/D3	55	I	PG7/EX01
16	I/O, O, I/O	PC2/RT02/D2	56	I	PG6/EX00
17	I/O, O, I/O	PC1/PP017/D1	57	I	PG5/SYNC1
18	I/O, O, I/O	PC0/PP016/D0	58	I	PG4/SYNC0
19	I/O, O	PD7/HALT	59	I	PG3/PBCTL
20	I/O, O	PD6/BRQ	60	I	PG2/DPS
21	I/O, O	PD5/BAK	61	I	PG1/DPS
22	I/O, O	PD4/SYNC	62	I	PG0/CFG
23	I/O, O	PD3/C	63	O	PE7/DAB1
24	I/O, O	PD2/R/W	64	O	PE6/DAB0
25	I/O, O	PD1/R/W	65	O	PE5/DAA1
26	I/O, O	PD0/RD	66	O	PE4/DAA0
27	O	PH3	67	O	PE3/PWM0
28	O	PH2	68	O	PE2/PWM0
29	O	PH1	69	I	PE1/EC/INT2
30	O	PH0	70	I	PE0/INT0
31	I	MP	71	I	NMI
32	I/O	RST	72	-	VDD
33	-	GND	73	-	GND
34	O	XTAL	74	-	NC
35	I	EXTAL	75	O	PA7/PP07A15
36	I	CS0	76	O	PA6/PP06A14
37	I	SIO	77	O	PA5/PP05A13
38	O	SCK0	78	O	PA4/PP04A12
39	I/O	SCK0	79	O	PA3/PP03A11
40	I	PF7/INT1/CS1	80	O	PA2/PP02A10

15	PC0 / PP00A8	PC0 / PP00A8	31	INPUT	AN0 - AN7	: ANALOG INPUTS
17	PC1 / PP01A9	PC1 / PP01A9	32	BRQ	: BUS REQUEST INPUT	
18	PC2 / PP01A9	PC2 / PP01A9	33	CFG	: CAPSTAN FG INPUT	
19	PC3 / RT03/D3	PC3 / RT03/D3	34	CS0,1	: CHIP SELECT INPUTS	
20	PC4 / RT04/D4	PC4 / RT04/D4	35	DFG	: DRUM FG INPUT	
21	PC5 / RT05/D5	PC5 / RT05/D5	36	DPG	: DRUM PG INPUT	
22	PC6 / RT06/D6	PC6 / RT06/D6	37	EC	: EVENT INPUT	
23	PC7 / RT07/D7	PC7 / RT07/D7	38	EX01,1	: EXTERNAL INPUTS	
24	PC8 / RT08/D8	PC8 / RT08/D8	39	EXTAL	: SYSTEM CLOCK GENERATE JOINT	
25	PC9 / RT09/D9	PC9 / RT09/D9	40	HALT	: CPU STOP INPUT	
26	PC10 / RT10/D10	PC10 / RT10/D10	41	INT0 - INT2	: EXTERNAL OFFERING INPUTS	
27	PC11 / RT11/D11	PC11 / RT11/D11	42	MP	: MICRO PROCESSOR MODE INPUT	
28	PC12 / RT12/D12	PC12 / RT12/D12	43	NMI	: NONMASKABLE OFFERING INPUT	
29	PC13 / RT13/D13	PC13 / RT13/D13	44	PBCTL	: PB CTL PULSE INPUT	
30	PC14 / RT14/D14	PC14 / RT14/D14	45	PE0,1	: PORT E INPUTS	
31	PC15 / RT15/D15	PC15 / RT15/D15	46	PE0 - PE7	: PORT E INPUTS	
32	PC16 / RT16/D16	PC16 / RT16/D16	47	PG0 - PG7	: PORT G INPUTS	
33	PC17 / RT17/D17	PC17 / RT17/D17	48	SIO,1	: SERIAL DATA INPUTS	
34	PC18 / RT18/D18	PC18 / RT18/D18	49	SYNC0,1	: COMPOSITE SYNC INPUTS	
35	PC19 / RT19/D19	PC19 / RT19/D19	50	OUTPUT	AO - A15	: ADDRESS BUS OUTPUTS
36	PC20 / RT20/D20	PC20 / RT20/D20	51	BAK	: BUS ACKNOWLEDGE OUTPUT	
37	PC21 / RT21/D21	PC21 / RT21/D21	52	C	: TIMING SIGNAL OUTPUT	
38	PC22 / RT22/D22	PC22 / RT22/D22	53	DAA0,1	: DA GATE PULSE OUTPUTS	
39	PC23 / RT23/D23	PC23 / RT23/D23	54	DAB0,1	: DA GATE PULSE OUTPUTS	
40	PC24 / RT24/D24	PC24 / RT24/D24	55	PA0 - PA7	: PORT A OUTPUTS	
41	PC25 / RT25/D25	PC25 / RT25/D25	56	PB0 - PB7	: PORT B OUTPUTS	
42	PC26 / RT26/D26	PC26 / RT26/D26	57	PE2 - PE7	: PORT E OUTPUTS	
43	PC27 / RT27/D27	PC27 / RT27/D27	58	PH0 - PH3	: PORT H OUTPUTS	
44	PC28 / RT28/D28	PC28 / RT28/D28	59	PP00 - PP018	: PROGRAMMABLE PATTERN GENERATOR OUTPUTS	
45	PC29 / RT29/D29	PC29 / RT29/D29	60	PWM0,1	: PWM OUTPUTS	
46	PC30 / RT30/D30	PC30 / RT30/D30	61	R/W	: CPU MACHINE CYCLE	
47	PC31 / RT31/D31	PC31 / RT31/D31	62	RD	: READ	
48	PC32 / RT32/D32	PC32 / RT32/D32	63	RT03 - RT07	: REAL TIME PULSE OUTPUTS	
49	PC33 / RT33/D33	PC33 / RT33/D33	64	SIO,1	: SERIAL DATA OUTPUTS	
50	PC34 / RT34/D34	PC34 / RT34/D34	65	SYNC	: SYNC	
51	PC35 / RT35/D35	PC35 / RT35/D35	66	WR	: WRITE	
52	PC36 / RT36/D36	PC36 / RT36/D36	67	XTAL	: SYSTEM CLOCK GENERATOR OUTPUT	
53	PC37 / RT37/D37	PC37 / RT37/D37	68	INPUT/OUTPUT	D0 - D7	: DATA BUS
54	PC38 / RT38/D38	PC38 / RT38/D38	69	PC0 - PC7	: PORT C	
55	PC39 / RT39/D39	PC39 / RT39/D39	70	PD0 - PD7	: PORT D	
56	PC40 / RT40/D40	PC40 / RT40/D40	71	RST	: RESET	
57	PC41 / RT41/D41	PC41 / RT41/D41	72	SCK0,1	: SERIAL CLOCK	
58	PC42 / RT42/D42	PC42 / RT42/D42	73	XTAL		
59	PC43 / RT43/D43	PC43 / RT43/D43	74			
60	PC44 / RT44/D44	PC44 / RT44/D44	75			
61	PC45 / RT45/D45	PC45 / RT45/D45	76			
62	PC46 / RT46/D46	PC46 / RT46/D46	77			
63	PC47 / RT47/D47	PC47 / RT47/D47	78			
64	PC48 / RT48/D48	PC48 / RT48/D48	79			
65	PC49 / RT49/D49	PC49 / RT49/D49	80			

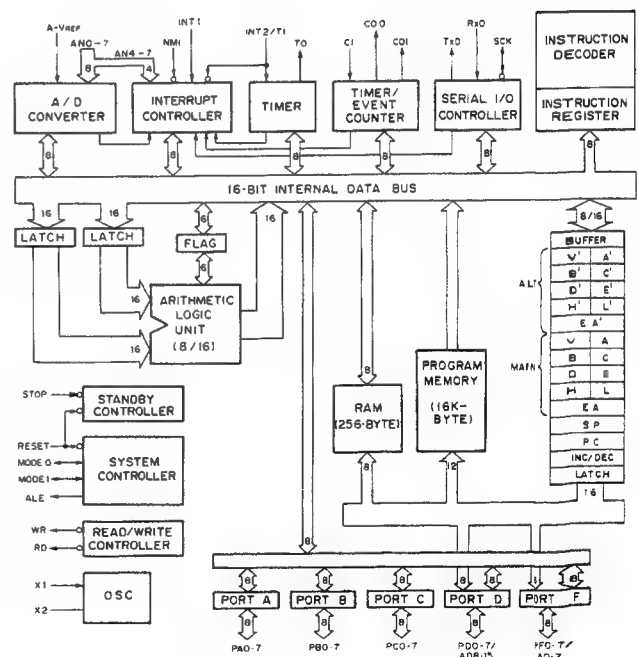
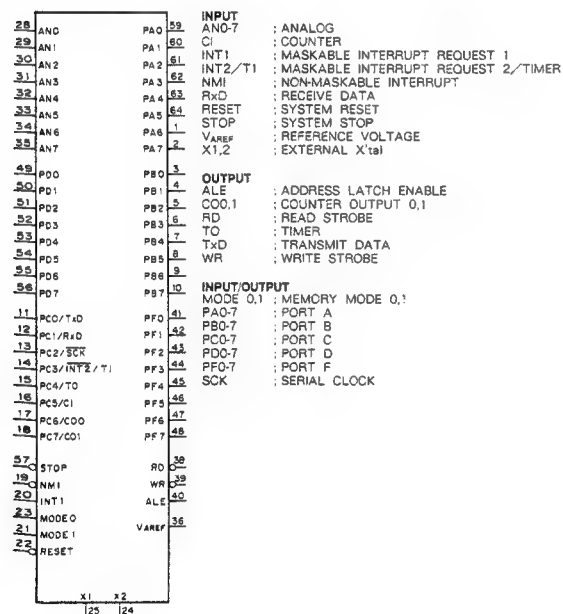


CXD8042Q (SONY) FLAT PACKAGE  
C-MOS TIMECODE CONTROLLER  
- TOP VIEW -



(A  $V_{DD} = +5V$ )  
( $V_{DD} = +5V$ )

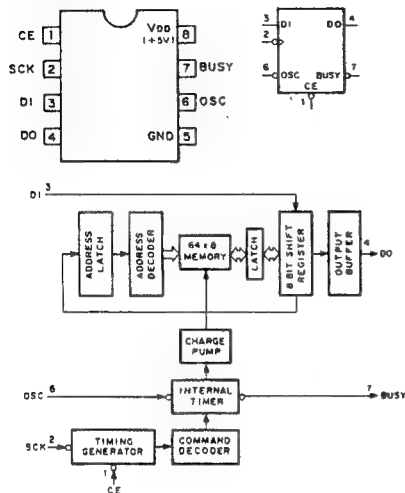
PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL
1	I/O	PA6	17	I/O	PC6/CO0	33	I	AN5	49	I/O	PD0
2	I/O	PA7	18	I/O	PC7/CO1	34	I	AN6	50	I/O	PD1
3	I/O	PB0	19	I	NMI	35	I	AN7	51	I/O	PD2
4	I/O	PB1	20	I	INT1	36	I	VAREP	52	I/O	PD3
5	I/O	PB2	21	I/O	MODE1	37	-	A VDD	53	I/O	PD4
6	I/O	PB3	22	I	RESET	38	O	RD	54	I/O	PD5
7	I/O	PB4	23	I/O	MODE0	39	O	WR	55	I/O	PD6
8	I/O	PB5	24	I	X2	40	O	ALE	56	I/O	PD7
9	I/O	PB6	25	I	X1	41	I/O	PF0	57	I	STOP
10	I/O	PB7	26	-	GND	42	I/O	PF1	58	-	VDD
11	I/O	PC0/TxD	27	-	A GND	43	I/O	PF2	59	I/O	PA0
12	I/O	PC1/RxD	28	I	AN0	44	I/O	PF3	60	I/O	PA1
13	I/O	PC2/SCK	29	I	AN1	45	I/O	PF4	61	I/O	PA2
14	I/O	PC3/INT2/T1	30	I	AN2	46	I/O	PF5	62	I/O	PA3
15	I/O	PC4/T0	31	I	AN3	47	I/O	PF6	63	I/O	PA4
16	I/O	PC5/CI	32	I	AN4	48	I/O	PF7	64	I/O	PA5



## CXK1011P (SONY)

N-MOS 512-BIT (64x8) NON-VOLATILE MEMORY

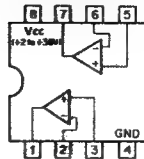
- TOP VIEW -



## LM2903M (RAYTHEON) FLAT PACKAGE

DUAL VOLTAGE COMPARATORS

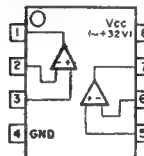
- TOP VIEW -



## LM2904M (NSC) FLAT PACKAGE

OPERATIONAL AMPLIFIER

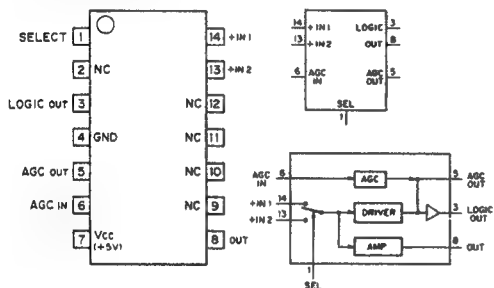
- TOP VIEW -



## LA7205M (SANYO)

AGC AMP, INPUT SELECT, AGC DET, COMPARATOR

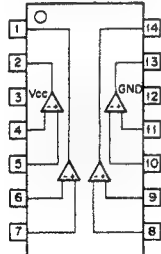
- SIDE VIEW -



## LM2901M (MOTOROLA)

SINGLE SUPPLY COMPARATOR

- TOP VIEW -

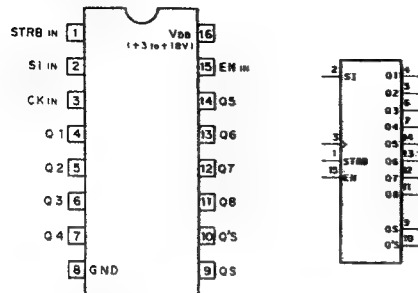








MC14094BF (MOTOROLA)  
C-MOS 8-STAGE SHIFT-AND-STORE BUS REGISTER  
- TOP VIEW -

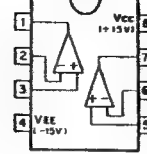


SI; SERIAL DATA INPUT  
CK; CLOCK INPUT  
STRB; STROBE INPUT  
EN; OUTPUT ENABLE INPUT  
Q1~Q8; PARALLEL DATA OUTPUTS  
Q'S, Q'S; SERIAL DATA OUTPUTS

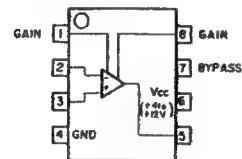
INPUTS				PARALLEL OUT		SERIAL OUT	
CK	EN	STRB	SI	Q1	Qn	Q5	Q'S
	0	X	X	HI-Z	HI-Z	Q7	NC
	0	X	X	HI-Z	HI-Z	NC	Q7
	1	0	X	NC	NC	Q7	NC
	1	1	0	0	Qn-1	Q7	NC
	1	1	1	1	Qn-1	Q7	NC
	1	1	1	NC	NC	NC	Q7

1; HIGH  
0; LOW  
X; DON'T CARE  
HI-Z; HIGH IMPEDANCE  
NC; NO CHANGE

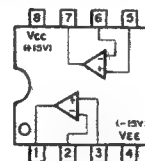
MC34182M (MOTOROLA) FLAT PACKAGE  
OPERATIONAL AMPLIFIER  
(J FET-INPUT)  
- TOP VIEW -



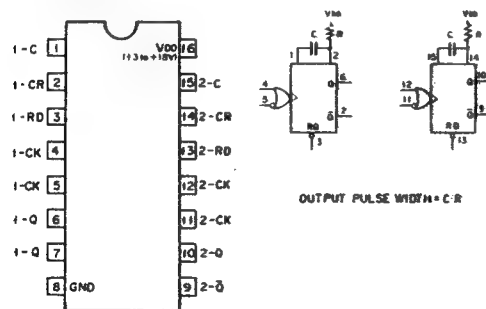
NJM386M (JRC) FLAT PACKAGE  
AUDIO POWER AMPLIFIER  
- TOP VIEW -



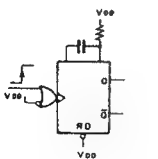
NJM2041M-D (JRC) FLAT PACKAGE  
NJM2043M-D (JRC) FLAT PACKAGE  
DUAL OPERATIONAL AMPLIFIER  
- TOP VIEW -



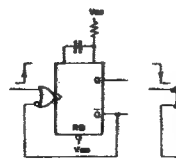
MC14538BF (MOTOROLA) FLAT PACKAGE  
C-MOS DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR  
- TOP VIEW -



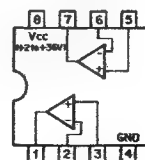
RETRIGGERABLE M.M.V



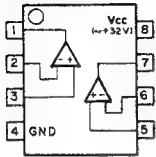
NON-RETRIGGERABLE M.M.V



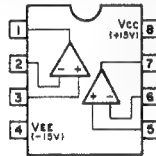
NJM2903M (JRC) FLAT PACKAGE  
DUAL VOLTAGE COMPARATORS  
- TOP VIEW -



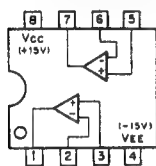
NJM2904M (JRC) FLAT PACKAGE  
OPERATIONAL AMPLIFIER  
- TOP VIEW -



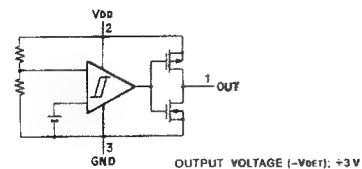
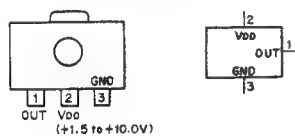
NJM4556M-A (JRC) FLAT PACKAGE  
OPERATIONAL AMPLIFIER  
(WIDE BAND, DECOMPENSATED)  
- TOP VIEW -



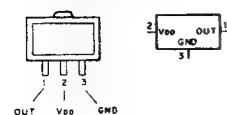
NJM4560MD (JRC) FLAT PACKAGE  
RC2041MD (RAYTHEON) FLAT PACKAGE  
RC2043MD (RAYTHEON) FLAT PACKAGE  
RC4558M (RAYTHEON) FLAT PACKAGE  
DUAL OPERATIONAL AMPLIFIER  
- TOP VIEW -



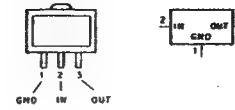
RH5VA30CA (RICOH)  
C-MOS VOLTAGE DETECTOR  
- SIDE VIEW -



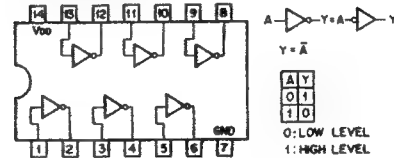
S-8054HN-CB (SEIKO)  
+ 6V VOLTAGE DETECTOR WITH N-CHANNEL OPEN DRAIN OUTPUT  
- TOP VIEW -



S-81230AG-RB (SEIKO) +5.0V FLAT PACKAGE  
THREE TERMINAL POSITIVE VOLTAGE REGULATOR  
- TOP VIEW -



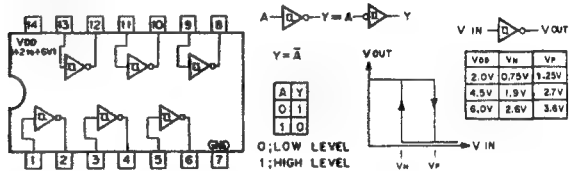
SN74HC04ANS (TI) FLAT PACKAGE  
C-MOS HEX INVERTER  
- TOP VIEW -



NOTE:

TYPE	V <sub>DD</sub>
74ACT04 TYPES	+5V
74HC04 TYPES	+5V
TC74AC04F	+2 to +5.5V
TC74ACT04F	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

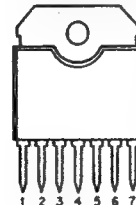
SN74HC14ANS (TI) FLAT PACKAGE  
C-MOS SCHMITT TRIGGER INVERTER  
- TOP VIEW -



NOTE:

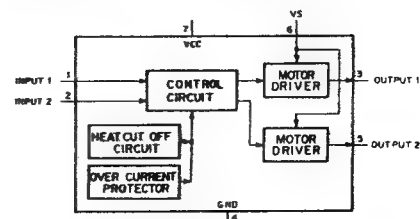
TYPE	V <sub>DD</sub>
74AC74HC	+2 to +6V
TC74AC14	+2 to +5.5V

TA7267P (TOSHIBA)  
DC MOTOR DRIVER  
- PRINTED SIDE VIEW -



INPUTS		OUTPUTS		MODE
1	2	1	2	
1	1	0	0	BRAKE
0	1	0	1	ROTATION / REV. ROTATION
1	0	1	0	REV. ROTATION / ROTATION
0	0	1	1	STOP

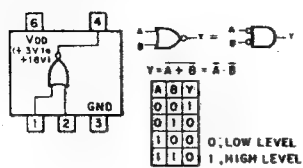
0 : LOW LEVEL  
1 : HIGH LEVEL  
H-Z: HIGH IMPEDANCE



## TC4S01F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT NOR GATE

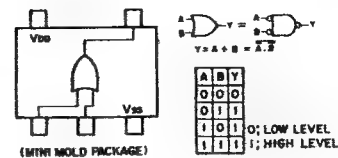
- TOP VIEW -



## TC4S71F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT OR GATE

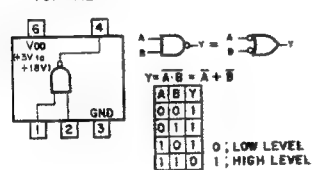
- TOP VIEW -



## TC4S11F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT NAND GATE

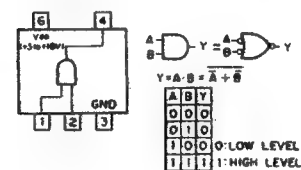
- TOP VIEW -



## TC4S81F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT AND GATE

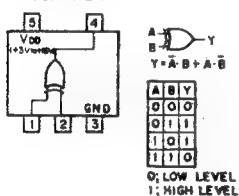
- TOP VIEW -



## TC4S30F (TOSHIBA) FLAT PACKAGE

C-MOS EXCLUSIVE OR GATE

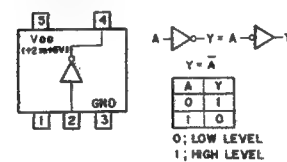
- TOP VIEW -



## TC7SU04F (TOSHIBA) FLAT PACKAGE

C-MOS INVERTER

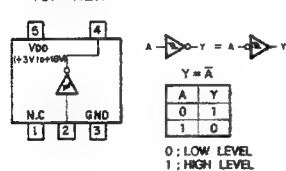
- TOP VIEW -



## TC4S584F (TOSHIBA) FLAT PACKAGE

C-MOS SCHMITT TRIGGER INVERTER

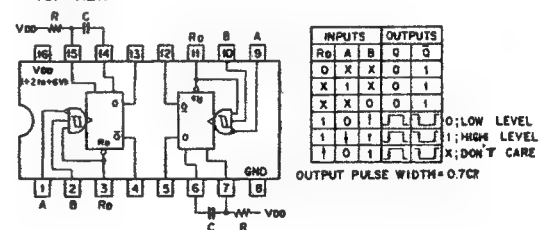
- TOP VIEW -



## TC74HC221AF (TOSHIBA) FLAT PACKAGE

C-MOS MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT

- TOP VIEW -

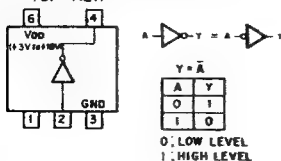


## TC4S69F (TOSHIBA) FLAT PACKAGE

TC4S69F (TOSHIBA) FLAT PACKAGE

C-MOS INVERTER BUFFER

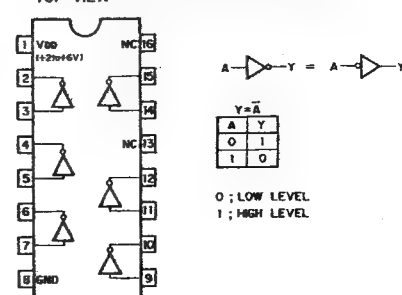
- TOP VIEW -



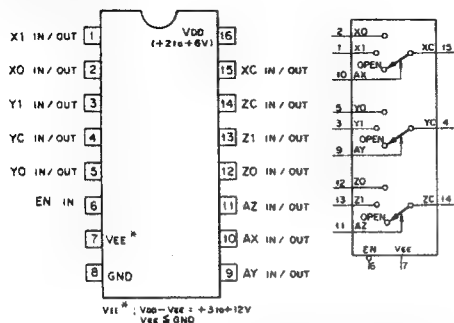
## TC74HC4049AF (TOSHIBA) FLAT PACKAGE

C-MOS HEX BUFFER/CONVERTER (INVERTING)

- TOP VIEW -



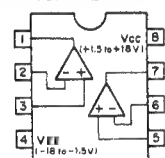
## TC74HC4053AF (TOSHIBA) FLAT PACKAGE

C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULPLEXER  
- TOP VIEW -

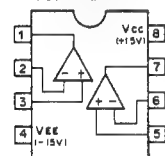
CONT. INPUTS	ON
EN A (X,Y,Z)	CHANNEL
0	0
0	1
1	X
	OPEN

0: LOW LEVEL  
1: HIGH LEVEL  
X: DON'T CARE.

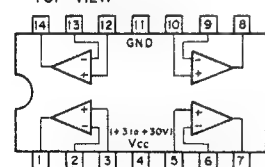
## TL062CPS (TI) FLAT PACKAGE

OPERATIONAL AMPLIFIER  
(JFET INPUT)  
- TOP VIEW -

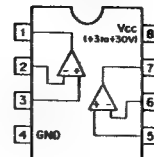
## TL072CPS (TI) FLAT PACKAGE

OPERATIONAL AMPLIFIER  
(LOW-NOISE, JFET-INPUT)  
- TOP VIEW -

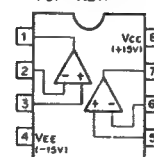
## UPC324G2 (NEC) FLAT PACKAGE

QUAD. OP. AMPLIFIER  
- TOP VIEW -

## UPC358G2 (NEC) FLAT PACKAGE

DUAL OPERATIONAL AMPLIFIERS  
- TOP VIEW -

## UPC4572G2 (NEC) FLAT PACKAGE

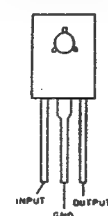
OPERATIONAL AMPLIFIER (WIDE BAND, LOW NOISE)  
- TOP VIEW -

## UPC78L05 (NEC) +5V

POSITIVE VOLTAGE REGULATOR (100mA)



## UPC78N05H (NEC) +5V

POSITIVE VOLTAGE REGULATOR  
- FRONT VIEW -



## SECTION 13

### REPLACEABLE PART AND OPTIONAL FIXTURE

#### 13-1. NOTES ON REPAIR PARTS

##### (1) Safety Related Components Warning

Components marked with  $\Delta$  on the schematic diagrams, exploded views and electrical repair parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear in this manual or in service bulletin and service manual supplements published by Sony.

##### (2) Standardization of Parts

Repair parts supplied from Sony Parts Center may not be always identical with the parts which actually in use due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".

This manual's exploded views and electrical parts list are indicating the part numbers of "the standardized genuine parts at present"

##### (3) Changes of Parts

Regarding engineering parts changes, refer to "Section 14 CHANGED PART"

##### (4) Stock of Parts

Parts marked with "o" SP (Supply Code) column of the repair parts list are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

##### (5) Units for Capacitors, Inductors and Resistors

The following units may be assumed in schematic diagrams, electrical parts list and exploded views unless otherwise specified.

Capacitors :  $\mu\text{F}$   
 Inductors :  $\mu\text{H}$   
 Resistors :  $\Omega$

##### (6) Tension Spring

(x x T) after a tension spring is shown on the parts list in order to indicate the number of spring turns required for the use.

(Example) TENSION, SPRING (20 T) :  
 This spring must be cut at its 20th turn for actual use.

#### 13-2. EXPLODED VIEW

• Exploded views are composed of the following blocks

	Page
(1) Cabinet Block (1) .....	13-2
(2) Cabinet Block (2) .....	13-4
(3) Cassette-up Compartment .....	13-6
(4) Reel Drive Block (Supply Side) .....	13-8
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(7) Threading Ring .....	13-14
(8) Gear Block .....	13-16
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(11) Reel Chassis (Back Side) .....	13-22
(12) Side Panel (1) .....	13-24
(13) Side Panel (2) .....	13-26
(14) Battery Case/Connector Box .....	13-28

**CABINET BLOCK (1)**

No.	Parts No.	SP	Description
1	A-6703-714-B	o	PANEL ASSY, TOP
2	A-6703-719-A	o	HANDLE ASSY
3	A-6731-177-A	s	KEY BOARD ASSY
4	X-3166-118-2	o	PANEL SUB ASSY, REAR
5	X-3744-307-1	s	SUSPENSION ASSY
6	1-570-608-11	s	SWITCH, TOGGLE
7	1-640-282-11	o	PRINTED CIRCUIT BOARD, SW-457
8	3-171-650-01	o	BRACKET, TALLY
9	3-171-659-01	o	STOPPER (A), VO
10	3-171-660-01	o	STOPPER (B), VO
11	3-171-661-02	o	PLATE, SLIDE
12	3-171-679-01	o	HOLDER, LED (FOR S/N 10001 THRU 10100)
	3-670-095-00	o	HOLDER, LED (FOR S/N 10101 AND HIGHER)
13	3-171-749-01	o	BASE
14	3-171-750-01	s	COVER, TALLY
15	3-171-755-01	o	COVER, HANDLE
16	3-173-135-01	s	RING, DROP PROTECTION
17	3-673-281-00	o	SPRING, COMPRESSION
18	3-711-715-01	o	RUBBER, SHIELD
19	3-717-854-01	o	SHAFT, KEY BOARD COVER
20	3-718-028-01	o	HOLDER, TERMINAL
21	3-718-042-21	o	FRAME, KEY BOARD
22	3-718-043-23	o	COVER, KEY BOARD
23	3-718-044-01	s	COVER, KEY BOARD RUBBER
24	3-718-179-01	s	COVER (2), TOP
25	3-724-723-01	s	RUBBER (BATT), DROP PROTECTION
26	3-725-907-01	s	BUSHING, BLIND
27	3-729-009-04	o	INSULATOR (BATT)



**CABINET BLOCK (2)**

No.	Parts No.	SP	Description
101	A-6703-712-B	o	PANEL ASSY, FRONT
102	A-6703-715-B	o	PANEL ASSY, BOTTOM
103	A-6703-718-C	o	LID ASSY, VR
104	A-6704-548-A	s	LID ASSY, CASSETTE COMPARTMENT
105	A-6713-471-A	o	MOUNTED CIRCUIT BOARD, AU-144P
106	A-6754-343-A	o	MOUNTED CIRCUIT BOARD, CN-504
107	A-6754-345-A	o	MOUNTED CIRCUIT BOARD, MB-363
108	X-3166-095-2	o	HINGE (L) ASSY, PLATE, SIDE
109	X-3166-096-2	o	HINGE (R) ASSY, PLATE, SIDE
110	X-3166-099-2	o	BASE (A) ASSY, HINGE
111	X-3166-100-2	o	BASE (B) ASSY, HINGE
112	1-466-600-11	s	CONVERTER UNIT, DC/DC
113	3-171-649-01	o	COVER, FRONT
114	3-171-651-01	o	SHEET, INSULATING, MB
115	3-171-656-01	o	PIN, INSERTING PROTECTION
116	3-171-657-01	o	STOPPER (A), PLATE, SIDE
117	3-171-658-01	o	STOPPER (B), PLATE, SIDE
118	3-171-662-01	o	STOPPER, CN COVER
119	3-171-674-01	o	BRACKET, FLOATING
120	3-171-676-01	o	BRACKET (B), MB
121	3-171-677-01	o	SUPPORT, HEXAGON
122	3-171-684-01	s	RUBBER (CASSETTE)
123	3-171-753-02	o	BRACKET (2), TAPE
124	3-171-754-01	o	COVER, CN
125	3-171-807-01	o	CASE (A), SHIELD, AU
126	3-171-808-01	o	CASE (B), SHIELD, AU (FOR S/N 10001 THRU 10500)
	X-3166-584-1	o	CASE (B) ASSY, SHIELD AU (FOR S/N 10501 AND HIGHER)
127	3-171-830-02	s	RUBBER, DROP PROTECTION
128	3-172-695-01	o	HOLDER, CN
129	3-531-576-11	s	RIVET
130	3-669-596-00	s	WASHER (2.3), STOPPER
131	3-701-822-00	o	HOLDER, WIRE
132	3-703-074-00	s	CAP 3, SHAFT
133	3-711-715-01	o	RUBBER, SHIELD
134	3-717-945-01	o	HINGE (E) (RIGHT)
135	3-717-995-01	o	RETAINER, AU
136	3-729-701-11	s	RUBBER (CARBON), CONDUCTIVE
137	3-744-355-01	o	SHAFT, GUIDE

# CASSETTE-UP COMPARTMENT

No.	Parts No.	SP	Description
201	A-6751-365-H	s	CASSETTE COMPARTMENT ASSY
202	X-3166-197-2	o	STOPPER (L) ASSY
203	X-3166-198-2	o	STOPPER (R) ASSY
204	3-172-250-01	s	SPRING, TENSION
205	3-172-265-02	s	ROLLER, ARM
206	3-172-266-01	o	SPRING (L), RETAINER
207	3-172-267-01	o	SPRING (R), RETAINER
208	3-676-221-00	s	ROLLER, LOCK
209	3-679-164-00	s	SPRING, TENSION
210	3-681-527-00	s	SPRING, TENSION
211	3-681-528-00	o	DAMPER
212	3-701-439-21	s	WASHER, POLY 3MM DIA. 0.5T
213	3-717-803-02	o	SPRING (LEFT)
214	3-717-804-01	o	SPRING (RIGHT)
215	3-717-805-01	o	RETAINER (LEFT), CASSETTE
216	3-718-049-01	o	RETAINER (RIGHT), CASSETTE
217	3-718-050-01	s	GEAR

# REEL DRIVE BLOCK (S SIDE)

No.	Parts No.	SP	Description
301	A-6747-275-2	o	SHAFT ASSY, BAND
302	X-3166-105-2	o	ARM (A) ASSY, T
303	X-3166-106-1	o	ARM (B) ASSY, T
304	X-3166-110-2	s	SHAFT ASSY, RELAY PULLEY
305	X-3166-111-1	s	PULLEY ASSY, RELAY
306	X-3166-112-3	s	BRAKE ASSY, S SOFT
307	X-3166-116-1	s	IDLER SUB ASSY
308	X-3717-720-2	o	BASE ASSY, BAND SHAFT
309	X-3717-733-3	s	TABLE ASSY, REEL
310	X-3717-734-5	s	BRAKE ASSY, MAIN, S (FOR S/N 10001 THRU 10800)
	X-3166-577-1	s	BRAKE ASSY, MAIN, S (FOR S/N 10801 AND HIGHER)
311	X-3717-735-4	s	BRAKE ASSY, MAIN, T
312	X-3717-736-1	s	BAND ASSY, T
313	1-454-382-31	s	SOLENOID, PLUNGER
314	3-140-263-XX	s	SPRING, TENSION (23T) (FOR S/N 10001 THRU 12868)
	2-357-413-01	s	SPRING, TENSION (23T) (FOR S/N 12869 AND HIGHER)
315	3-171-716-01	s	ROLLER, T
316	3-171-717-01	s	SPRING, BAND RETURN
317	3-547-659-00	s	SPRING, TENSION
318	3-555-026-00	s	SPRING, TENSION (FOR S/N 10001 THRU 10800)
	3-646-302-00	s	SPRING, COMPRESSION (FOR S/N 10801 AND HIGHER)
319	3-669-465-00	s	WASHER (1.5), STOPPER
320	3-676-322-00	s	BEARING, THRUST
321	3-701-438-21	s	WASHER, POLY, 2.5 MM DIA. 0.5T
322	3-701-439-01	s	WASHER, POLY, 3 MM DIA. 0.13T
323	3-701-439-11	s	WASHER, POLY, 3 MM DIA. 0.25T
324	3-701-439-21	s	WASHER, POLY, 3 MM DIA. 0.5T
325	3-703-074-00	s	CAP 3, SHAFT
326	3-717-908-01	s	BELT, REEL
327	3-717-912-01	s	ARM, PROHIBITION
328	3-717-952-01	o	BRACKET, SOLENOID
329	3-717-983-01	o	STOPPER, IDLER
330	3-717-985-01	o	LINING, LIMITER
331	3-717-986-01	o	SHAFT, ARM, DRIVING
332	3-717-987-01	o	RETAINER (1), SPRING
333	3-717-988-01	o	GEAR, IDLER
334	3-717-992-01	o	STOPPER
335	4-866-079-01	s	SPRING, COMPRESSION

**REEL DRIVE BLOCK (T SIDE)**

No.	Parts No.	SP	Description
401	A-6759-416-A	s	PULLEY (1) (PS) ASSY
402	X-3166-097-4	o	STOPPER ASSY
403	X-3166-101-2	s	LEVER ASSY, LOCK
404	X-3166-102-2	o	BASE ASSY, EJECT
405	X-3166-103-2	o	LINK (1) ASSY
406	X-3166-104-1	o	PLATE ASSY, LIMITER
407	X-3166-113-1	s	BRAKE ASSY, T SOFT
408	X-3717-733-3	s	TABLE ASSY, REEL
409	X-3717-770-1	o	PULLEY (2) ASSY
410	3-171-695-01	s	SPRING, LIMITER
411	3-171-809-01	o	LINK (2)
412	3-669-465-00	s	WASHER (1.5), STOPPER
413	3-676-322-00	s	BEARING, THRUST
414	3-701-439-01	s	WASHER, POLY 3 MM DIA. 0.13T
415	3-701-439-11	s	WASHER, POLY 3 MM DIA. 0.25T
416	3-701-439-21	s	WASHER, POLY 3 MM DIA. 0.5T
417	3-703-074-00	s	CAP 3, SHAFT
418	3-717-903-01	s	CUSHION, REEL TABLE
419	3-718-127-01	o	RETAINER, BEARING
420	3-723-052-01	s	SPRING (A), TORSION
421	A-8262-736-A	s	MOTOR ASSY, REEL

**TENSION REGULATOR BLOCK**

No.	Parts No.	SP	Description
501	A-6742-075-A	s	TENSION REGULATOR ASSY (FOR S/N 10501 THRU 11220)
	A-6742-062-A	s	TENSION REGULATOR ASSY (FOR S/N 11221 AND HIGHER)
502	X-3717-737-1	s	ROD ASSY, PULL
503	1-806-682-81	s	SENSOR, DEW CONDENSATION
504	2-618-901-00	s	SPRING
505	3-171-653-01	o	GUIDE, PINCH ROLLER
506	3-171-751-01	s	ACTUATOR
507	3-171-752-01	o	SLIDER
508	3-172-366-02	s	ACTUATOR (M)
509	3-172-877-01	s	ROLLER, T.R (FOR S/N 10501 THRU 11220)
	X-3675-851-0	s	ROLLER ASSY, TR (FOR S/N 11221 AND HIGHER)
510	3-172-878-01	s	SLEEVE (T)
511	3-172-879-01	s	FLANGE (T), UPPER (FOR S/N 10501 THRU 11220)
	3-677-752-01	s	NUT, ADJUSTMENT, T (FOR S/N 11221 AND HIGHER)
512	3-172-880-01	s	FLANGE (T), LOWER (FOR S/N 10501 THRU 11220)
	3-717-859-01	s	FLANGE, TR (LOWER) (FOR S/N 11221 AND HIGHER)
513	3-674-402-00	s	SPRING, TENSION
514	3-684-290-01	s	SPRING, COMPRESSION
515	3-703-357-01	s	PIN, PARALLEL (DIA, 1.6x4)
516	3-717-905-01	s	SCREW, TENSION REGULATOR BASE
517	3-717-918-01	s	STOPPER, TENSION REGULATOR
518	4-875-562-00	s	SPRING, TENSION

**THREADING RING**

No.	Parts No.	SP	Description
601	X-3166-107-2	s	ARM ASSY, PINCH
602	X-3717-727-1	s	ROLLER (A) ASSY, RING
603	X-3717-728-1	s	ROLLER (B) ASSY, RING
604	X-3717-729-1	s	PLATE ASSY, ADJUSTMENT
605	X-3717-743-1	s	RING SUB ASSY, THREADING
606	1-543-316-21	s	HEAD, SENSING (SMALL TYPE)
607	2-279-715-01	s	RIVET, NYLON
608	3-171-655-01	o	BRACKET, MOTOR
609	3-171-710-02	o	STOPPER, RING
610	3-171-812-01	o	BASE, SENSOR, TAPE (TOP)
611	3-676-304-00	s	SPRING
612	3-701-436-01	s	WASHER, POLY, 1.6 MM DIA. 0.13T
613	3-701-436-11	s	WASHER, POLY, 1.6 MM DIA. 0.25T
614	3-701-436-21	s	WASHER, POLY, 1.6 MM DIA. 0.5T
615	3-718-024-01	s	PLATE, CORRECTION, SLANT GUIDE
616	7-627-552-38	s	SCREW, PRECISION +P 1.7x3
617	8-835-462-01	s	MOTOR, DC DN20-Q7Z2B

# GEAR BLOCK

No.	Parts No.	SP	Description
701	A-6746-056-A	s	GUIDE ASSY, T DRAWER
702	A-6750-297-A	s	GEAR BLOCK ASSY
703	X-3166-108-1	s	ROTOR ASSY
704	X-3717-702-2	o	ARM ASSY, T DRAWER
705	X-3717-703-2	s	LINK ASSY, SLANT
706	1-640-284-11	o	PRINTED CIRCUIT BOARD, SE-164
707	3-171-724-01	o	GEAR (3-1)
708	3-171-725-01	o	GEAR (3-2)
709	3-171-726-01	o	GEAR (35-1)
710	3-171-727-01	o	GEAR, MANUAL
711	3-171-728-01	o	GEAR (5-1)
712	3-171-729-01	o	GEAR (5-2)
713	3-171-730-01	o	GEAR, RING
714	3-171-731-01	o	GEAR (5-3)
715	3-171-732-01	o	GEAR (1)
716	3-171-733-01	o	GEAR (2)
717	3-171-734-01	o	GEAR, S
718	3-171-735-01	o	PINION
719	3-559-408-11	s	WASHER, POLY 1.2 MM DIA
720	3-717-725-02	o	TRAVELLER, TAPE
721	3-717-728-03	s	ARM, TD
722	3-717-729-01	o	SPRING
723	3-717-736-01	o	LIMITER (LOWER)
724	3-717-740-01	o	LIMITER (UPPER)
725	3-718-181-01	s	SPRING
726	3-669-465-00	s	WASHER (1.5), STOPPER

**DRUM**

No.	Parts No.	SP	Description
801	A-6762-455-A	s	UPPER DRUM ASSY (DBR-23-R)
802	A-6050-833-A	s	DRUM ASSY (DBH-23A-R)
803	A-6736-899-A	o	HEAD ASSY, AUDIO
804	A-6737-208-A	s	MOTOR ASSY, DRUM
805	A-6746-023-E	s	GUIDE ASSY, ENTRANCE
806	A-6746-024-E	s	GUIDE ASSY, EXIT
807	X-3165-802-1	s	PULLEY ASSY
808	X-3166-357-1	s	GROUND ASSY, SHAFT
809	3-170-801-01	s	PLATE, SHIELD, C
810	3-171-587-01	s	+PSW 2.6x6
811	3-171-654-01	o	BRACKET (1), TAPE
812	3-171-714-01	o	BRACKET (A), A HEAD
813	3-171-715-01	o	BRACKET (B), A HEAD
814	3-643-451-00	s	SCREW, AZIMUTH ADJUSTMENT
815	3-653-350-00	s	SPRING, COMPRESSION
816	3-676-137-02	s	FLANGE, TAPE ROLLER
817	3-717-120-01	s	SPACER, FLANGE
818	3-717-120-11	s	SPACER, FLANGE
819	3-717-120-21	s	SPACER, FLANGE
820	3-717-120-31	s	SPACER, FLANGE
821	3-717-792-01	s	STOPPER, HEAD
822	3-717-794-01	s	SPRING, COMPRESSION
823	3-717-795-01	o	BRACKET, CTL HEAD
824	3-717-796-01	o	DECK, CTL HEAD
825	3-717-797-01	o	SPACER, CTL HEAD
826	3-717-798-03	o	BRACKET, FE HEAD
827	3-717-874-01	o	SUPPORT (A), AU HEAD
828	3-717-875-01	o	SUPPORT (B), AU HEAD
829	3-717-919-01	o	PULLEY, MOTOR, D
830	3-717-920-01	o	ADJUSTOR, Y
831	3-717-923-01	s	GUIDE, DUMMY
832	3-729-076-11	s	SCREW (+B) (2x4)
833	3-732-012-11	s	SCREW (M2x5)
834	8-825-554-83	s	HEAD, CTL PS244-21B
835	8-825-770-72	s	HEAD, FE EF291-21
836	8-825-776-11	s	HEAD, AU PS244-2103D
837	8-835-437-01	s	MOTOR, DC SCV-0201A
838	3-676-138-01	s	ROLLER, TAPE



**PINCH PRESS MECHANISM**

No.	Parts No.	SP	Description
901	A-6747-276-A	s	PRESS ASSY, PINCH
902	X-3166-109-1	o	SENSOR SUB ASSY
903	X-3717-711-1	o	LEVER (B) ASSY, PINCH PRESS
904	X-3717-712-1	o	ARM ASSY, JOINT
905	X-3717-725-1	o	BASE ASSY, PINCH LEVER
906	X-3717-726-1	o	LEVER (D) ASSY, PINCH PRESS
907	1-454-445-21	s	SOLENOID, PLUNGER
908	1-543-316-21	s	HEAD, SENSING (SMALL TYPE)
909	1-622-630-11	o	PRINTED CIRCUIT BOARD, SE-60
910	2-279-715-01	s	RIVET, NYLON
911	3-531-576-51	o	RIVET
912	3-547-664-00	s	SPRING, TENSION
913	3-669-465-00	s	WASHER (1.5), STOPPER
914	3-676-387-00	s	POLY-SLIDER (DIA, 1.6)
915	3-678-774-00	s	SPRING, TENSION
916	3-701-437-01	s	WASHER, POLY 2MM DIA. 0.13T
917	3-701-437-11	s	WASHER, POLY 2MM DIA. 0.25T
918	3-701-437-21	s	WASHER, POLY 2MM DIA. 0.5T
919	3-717-772-01	o	STOPPER
920	3-717-773-01	o	BASE (UPPER), PINCH
921	3-717-774-01	o	LEVER (A), PINCH PRESS
922	3-717-775-01	o	LEVER (C), PINCH PRESS
923	3-717-776-01	o	LEVER (A), RELEASE
924	3-717-777-01	o	LEVER (B), RELEASE
925	3-717-778-01	o	SPRING
926	3-717-779-02	o	SPACER, SOLENOID
927	3-717-780-01	o	SPRING
928	3-717-781-01	o	PLATE, ADJUSTMENT
929	3-717-869-01	s	ROLLER, PINCH
930	3-718-170-01	o	RETAINER, PINCH

**REEL CHASSIS (BACK SIDE)**

No.	Parts No.	SP	Description
1001	A-6715-457-A	o	MOUNTED CIRCUIT BOARD, SS-46P
1002	A-6727-373-A	o	MOUNTED CIRCUIT BOARD, VO-34P
1003	A-6754-344-A	o	MOUNTED CIRCUIT BOARD, MB-362
1004	3-171-675-01	o	BRACKET (A), MB
1005	3-171-681-01	o	HOLDER, GP 2S09
1006	3-171-817-02	o	GUARD, D.C
1007	3-173-136-05	o	PLATE, SHIELD, VO
1008	3-703-502-41	s	SCREW
1009	3-717-910-01	s	BELT, DRUM

**SIDE PANEL (1)**

No.	Parts No.	SP	Description
1101	A-6703-722-B	o	PANEL ASSY (P), SIDE
1102	A-6713-470-A	o	MOUNTED CIRCUIT BOARD, TC-60P
1103	X-3166-098-1	s	KNOB ASSY, SW
1104	X-3166-114-1	o	LID SUB ASSY, TC
1105	X-3722-416-1	s	KNOB (A) (ORANGE) ASSY, SW
1107	3-171-652-01	o	FOOT, SS
1108	3-171-666-01	o	SHAFT, LID, TC
1109	3-171-669-01	o	RETAINER, SW, PUSH
1110	3-171-671-03	s	RUBBER, LEVER, TC
1111	3-171-672-01	s	LEVER, TC
1112	3-171-757-01	s	RUBBER, TC DROP PROTECTION
1113	3-676-244-00	s	COVER, SWITCH
1114	3-703-357-06	o	PIN, PARALLEL (DIA, 1.6x14)
1115	3-711-715-01	o	RUBBER, SHIELD
1116	3-724-758-02	s	RUBBER (PUSH), DROP PROTECTION
1117	3-724-759-03	s	PUSH (SW)

SIDE PANEL (2)

No.	Parts No.	SP	Description
1201	A-6703-722-B	o	PANEL ASSY (P), SIDE
1202	X-3166-093-1	s	KNOB (A) ASSY, VR
1203	X-3166-094-1	s	KNOB (B) ASSY, VR
	3-174-288-01	s	(FOR S/N 10001 THRU 10500) KNOB (C), VR
1204	1-237-790-11	s	(FOR S/N 10501 AND HIGHER) RES, VAR, CARBON 10K
1205	1-503-293-00	s	SPEAKER
1206	1-520-495-11	s	METER, LEVEL
1207	1-520-495-21	s	METER, LEVEL
1208	1-553-448-00	s	SWITCH, TOGGLE
1209	3-171-663-01	o	BRACKET, METER
1210	3-171-664-01	s	SHEET, METER DROP PROTECTION
1211	3-171-665-02	o	STOPPER, LID, TC
1212	3-171-667-01	o	RETAINER, KNOB
1213	3-171-668-01	o	STOPPER, P KNOB
1214	3-171-670-01	s	SHEET, DROP PROTECTION
1215	3-171-756-01	s	KNOB, POSITION
1216	3-171-800-01	s	SHEET (A), DROP PROTECTION
1217	3-171-821-01	s	SHEET (B), DROP PROTECTION
1218	3-171-827-01	o	PAD SIDE
1219	3-669-596-00	s	WASHER (2.3), STOPPER
1220	3-724-726-01	o	HOLDER, SPEAKER
1221	3-176-190-01	s	CUSHION (SPEAKER) (FOR S/N 11221 AND HIGHER)

**BATTERY CASE/CONNECTOR BOX**

No.	Parts No.	SP	Description
1301	A-6703-651-C	s	CASE ASSY, BATTERY
1302	A-6732-406-A	s	BOX ASSY, CONNECTOR
1303	A-6754-347-A	o	MOUNTED CIRCUIT BOARD, HP-50
1304	X-3717-701-3	o	COVER ASSY, TOP, BATTERY
1305	1-507-980-41	s	JACK
1306	Δ 1-532-525-00	s	BREAKER, CIRCUIT
1307	1-560-999-41	s	CONNECTOR (WITH SW)
1308	1-562-382-31	s	CONNECTOR, BNC
1309	1-570-610-11	s	SWITCH TOGGLE
1310	1-573-618-11	s	CONNECTOR (ROUND TYPE)
1311	1-640-275-11	o	PRINTED CIRCUIT BOARD, CN-505
1312	1-640-276-12	o	PRINTED CIRCUIT BOARD, CN-560
1313	1-640-277-11	o	PRINTED CIRCUIT BOARD, IO-61
1314	1-640-279-11	o	PRINTED CIRCUIT BOARD, SW-474
1315	3-171-682-01	o	BRACKET, DC CONVERTER
1316	3-171-683-01	o	BRACKET, HP-50
1317	3-173-135-01	s	RING, DROP PROTECTION
1318	3-173-207-01	o	LABEL (1), CN BOX
1319	3-173-208-01	o	LABEL (2), CN BOX
1320	3-173-209-01	o	LABEL (3), CN BOX
1321	3-173-210-01	o	LABEL (4), CN BOX
1322	3-669-596-00	s	WASHER (2.3), STOPPER
1323	3-703-075-00	s	CAP 2, SHAFT
1324	3-717-702-01	s	PUSH BUTTON
1325	3-717-703-03	s	HOOK
1326	3-717-707-02	o	CUSHION (2)
1327	3-717-708-01	o	RETAINER, CASE
1328	3-717-709-01	o	SHAFT, LID
1329	3-717-821-01	s	CAP, BREAKER
1330	3-717-823-01	s	COVER, BNC
1331	3-718-040-01	o	COVER (1), BATTERY CASE
1332	3-718-172-01	o	RETAINER, HOOK
1333	3-729-720-01	o	CUSHION (LEFT)
1334	3-729-721-01	o	CUSHION (RIGHT)
1335	3-849-405-00	s	COVER, EARPHONE JACK
1336	4-872-529-00	o	FOOT, RUBBER
1337	9-911-838-XX	s	SHEET
1338	3-173-933-01	s	SHEET (HP-50), INSULATING

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### 13-3. ELECTRICAL PARTS LIST (1993. JAN.)

AU-144P BOARD

Ref. No. or Q'ty	Part No.	SP Description
lpc	A-6713-471-A	o MOUNTED CIRCUIT BOARD, AU-144P
lpc	3-171-807-01	o CASE (A), SHIELD, AU
lpc	3-171-808-01	o CASE (B), SHIELD, AU
C1	1-135-149-21	s TANTALUM, CHIP 2.2uF 10% 10V
C2	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C5	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C7	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C8	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C12	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C14	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C17	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C18	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C19	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C20	1-162-964-11	s CERAMIC, CHIP 0.001uF 10% 50V
C30	1-164-473-11	s CERAMIC, CHIP 820PF 5% 50V
C31	1-164-473-11	s CERAMIC, CHIP 820PF 5% 50V
C32	1-162-959-11	s CERAMIC, CHIP 330PF 5% 50V
C34	1-164-369-11	s CERAMIC, CHIP 330PF 5% 500V
C50	1-162-968-11	s CERAMIC, CHIP 0.0047uF 10% 50V
C51	1-162-968-11	s CERAMIC, CHIP 0.0047uF 10% 50V
C52	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C55	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C57	1-136-562-11	s FILM 0.0082uF 5% 630V
C58	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C59	1-135-149-21	s TANTALUM, CHIP 2.2uF 10% 10V
C60	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C102	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C104	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C107	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C111	1-162-915-11	s CERAMIC, CHIP 10PF 50V
C112	1-162-967-11	s CERAMIC, CHIP 0.0033uF 10% 50V
C113	1-162-965-11	s CERAMIC, CHIP 0.0015uF 10% 50V
C114	1-164-670-11	s CERAMIC, CHIP 1200PF 5% 16V
C130	1-164-489-11	s CERAMIC, CHIP 0.22uF 10% 16V
C134	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C135	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C136	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C138	1-164-369-11	s CERAMIC, CHIP 330PF 5% 500V
C140	1-164-489-11	s CERAMIC, CHIP 0.22uF 10% 16V
C142	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C143	1-162-587-11	s CERAMIC, CHIP 0.039uF 10% 25V
C202	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C204	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C207	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C211	1-162-915-11	s CERAMIC, CHIP 10PF 50V
C212	1-162-967-11	s CERAMIC, CHIP 0.0033uF 10% 50V
C213	1-162-965-11	s CERAMIC, CHIP 0.0015uF 10% 50V
C214	1-164-670-11	s CERAMIC, CHIP 1200PF 5% 16V
C230	1-164-489-11	s CERAMIC, CHIP 0.22uF 10% 16V
C234	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C235	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C236	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C238	1-164-369-11	s CERAMIC, CHIP 330PF 5% 500V
C240	1-164-489-11	s CERAMIC, CHIP 0.22uF 10% 16V
C242	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C243	1-162-587-11	s CERAMIC, CHIP 0.039uF 10% 25V
C301	1-162-959-11	s CERAMIC, CHIP 330PF 5% 50V
C302	1-164-217-11	s CERAMIC, CHIP 150PF 5% 50V

(AU-144P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
C304	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C305	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C306	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C307	1-162-957-11	s CERAMIC, CHIP 220PF 5% 50V
C308	1-135-149-21	s TANTALUM, CHIP 2.2uF 10% 10V
C309	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C401	1-162-959-11	s CERAMIC, CHIP 330PF 5% 50V
C402	1-164-217-11	s CERAMIC, CHIP 150PF 5% 50V
C404	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C405	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C406	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C407	1-162-957-11	s CERAMIC, CHIP 220PF 5% 50V
C408	1-135-149-21	s TANTALUM, CHIP 2.2uF 10% 10V
C409	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C503	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C504	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C505	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C506	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C507	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C510	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C603	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C604	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C605	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C606	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C607	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C610	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C701	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C702	1-137-341-11	s FILM 0.0022uF 1% 50V
C703	1-137-341-11	s FILM 0.0022uF 1% 50V
C704	1-137-342-11	s FILM 0.0039uF 1% 50V
C705	1-135-145-11	s TANTALUM, CHIP 0.47uF 10% 35V
C706	1-164-492-11	s CERAMIC, CHIP 0.15uF 10% 16V
C707	1-137-343-11	s FILM 0.0056uF 1% 50V
C708	1-137-344-11	s FILM 0.01uF 1% 50V
C709	1-137-345-11	s FILM 0.015uF 1% 50V
C710	1-137-346-11	s FILM 0.056uF 1% 50V
C711	1-164-489-11	s CERAMIC, CHIP 0.22uF 10% 16V
C713	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C715	1-163-135-00	s CERAMIC, CHIP 560PF 5% 50V
C717	1-164-695-11	s CERAMIC, CHIP 0.0022uF 5% 50V
C719	1-163-020-00	s CERAMIC, CHIP 0.0082uF 10% 50V
C721	1-163-139-00	s CERAMIC, CHIP 820PF 5% 50V
C723	1-164-695-11	s CERAMIC, CHIP 0.0022uF 5% 50V
C726	1-163-215-00	s CERAMIC, CHIP 0.0027uF 5% 50V
C727	1-163-141-00	s CERAMIC, CHIP 0.001uF 5% 50V
C728	1-164-346-11	s CERAMIC, CHIP 1uF 16V
C729	1-164-346-11	s CERAMIC, CHIP 1uF 16V
C730	1-163-809-11	s CERAMIC, CHIP 0.04uF 10% 25V
C731	1-162-959-11	s CERAMIC, CHIP 330PF 5% 50V
C801	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C802	1-137-341-11	s FILM 0.0022uF 1% 5V
C803	1-137-341-11	s FILM 0.0022uF 1% 5V
C804	1-137-342-11	s FILM 0.0039uF 1% 5V
C805	1-135-145-11	s TANTALUM, CHIP 0.4uF 10% 35V
C806	1-164-492-11	s CERAMIC, CHIP 0.15uF 10% 16V
C807	1-137-343-11	s FILM 0.0056uF 1% 5V
C808	1-137-344-11	s FILM 0.01uF 1% 50V
C809	1-137-345-11	s FILM 0.015uF 1% 50V

## (AU-144P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
C810	1-137-346-11	s FILM 0.056uF 1% 50V
C811	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C812	1-164-489-11	s CERAMIC, CHIP 0.22uF 10% 16V
C813	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C815	1-163-135-00	s CERAMIC, CHIP 560PF 5% 50V
C817	1-164-695-11	s CERAMIC, CHIP 0.0022uF 5% 50V
C819	1-163-020-00	s CERAMIC, CHIP 0.0082uF 10% 50V
C821	1-163-139-00	s CERAMIC, CHIP 820PF 5% 50V
C823	1-164-695-11	s CERAMIC, CHIP 0.0022uF 5% 50V
C826	1-163-215-00	s CERAMIC, CHIP 0.0027uF 5% 50V
C827	1-163-141-00	s CERAMIC, CHIP 0.001uF 5% 50V
C828	1-164-346-11	s CERAMIC, CHIP 1uF 16V
C829	1-164-346-11	s CERAMIC, CHIP 1uF 16V
C830	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C831	1-162-959-11	s CERAMIC, CHIP 330PF 5% 50V
C901	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C902	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C903	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C904	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C905	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C906	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C907	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C908	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C909	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C910	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C911	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C912	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C913	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C914	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C915	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C916	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C917	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C918	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C919	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C920	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C921	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C922	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
CN1	1-506-483-21	s CONNECTOR, 4P, MALE
CN2	1-506-483-21	s CONNECTOR, 4P, MALE
CN3	1-506-470-11	s CONNECTOR, 5P, MALE
CN4	1-506-469-11	s CONNECTOR, 4P, MALE
CN5	1-506-468-11	s CONNECTOR, 3P, MALE
CN6	1-506-471-11	s CONNECTOR, 6P, MALE
CN7	1-506-467-11	s CONNECTOR, 2P, MALE
CN8	1-506-467-11	s CONNECTOR, 2P, MALE
CV131	1-141-393-11	s CAP, TRIMMER 100PF
CV231	1-141-393-11	s CAP, TRIMMER 100PF
D1	8-719-123-82	s DIODE 1SS303
E1	1-535-877-22	o CHIP, TP
E2	1-535-877-22	o CHIP, TP
E3	1-535-877-22	o CHIP, TP
IC1	8-757-991-00	s IC CX7991
IC2	8-752-031-28	s IC CXA1098Q
IC111	8-759-710-77	s IC NJM4560MD
IC112	8-759-710-77	s IC NJM4560MD
IC301	8-759-981-58	s IC RC2043MD

## (AU-144P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
IC302	8-759-300-71	s IC HD14053BFP
IC303	8-759-710-77	s IC NJM4560MD
IC501	8-759-710-77	s IC NJM4560MD
IC502	8-759-981-92	s IC RC4558M
IC503	8-759-981-92	s IC RC4558M
IC504	8-759-981-92	s IC RC4558M
IC602	8-759-981-92	s IC RC4558M
IC603	8-759-981-92	s IC RC4558M
L1	1-408-429-00	s INDUCTOR 470uH
L2	1-408-429-00	s INDUCTOR 470uH
L3	1-408-794-00	s INDUCTOR, CHIP 270UH
L4	1-408-429-00	s INDUCTOR 470uH
L5	1-408-429-00	s INDUCTOR 470uH
LV111	1-410-854-21	s COIL, VARIABLE 18mH
LV131	1-410-853-21	s COIL, VARIABLE 4.5uH
LV211	1-410-854-21	s COIL, VARIABLE 18mH
LV231	1-410-853-21	s COIL, VARIABLE 4.5uH
Q1	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q2	8-729-905-18	s TRANSISTOR DTC144EU
Q3	8-729-105-08	s TRANSISTOR 2SA1330
Q4	8-729-105-08	s TRANSISTOR 2SA1330
Q5	8-729-141-48	s TRANSISTOR 2SB624-BV345
Q6	8-729-907-00	s TRANSISTOR DTC114EU
Q7	8-729-905-18	s TRANSISTOR DTC144EU
Q12	8-729-141-48	s TRANSISTOR 2SB624-BV345
Q14	8-729-230-63	s TRANSISTOR 2SC4116YG
Q15	8-729-230-63	s TRANSISTOR 2SC4116YG
Q16	8-729-905-12	s TRANSISTOR DTA144EU
Q17	8-729-905-18	s TRANSISTOR DTC144EU
Q50	8-729-141-75	s TRANSISTOR 2SD596-DV345
Q51	8-729-141-75	s TRANSISTOR 2SD596-DV345
Q54	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q55	8-729-905-12	s TRANSISTOR DTA144EU
Q56	8-729-117-32	s TRANSISTOR 2SC4177
Q57	8-729-920-99	s TRANSISTOR DTA114EU
Q58	8-729-905-18	s TRANSISTOR DTC144EU
Q59	8-729-920-99	s TRANSISTOR DTA114EU
Q60	8-729-905-18	s TRANSISTOR DTC144EU
Q131	8-729-209-07	s TRANSISTOR 2SC4213-B
Q132	8-729-209-07	s TRANSISTOR 2SC4213-B
Q231	8-729-209-07	s TRANSISTOR 2SC4213-B
Q232	8-729-209-07	s TRANSISTOR 2SC4213-B
Q302	8-729-209-07	s TRANSISTOR 2SC4213-B
Q305	8-729-105-37	s TRANSISTOR 2SC3360-N16
Q306	8-729-105-37	s TRANSISTOR 2SC3360-N16
Q307	8-729-209-07	s TRANSISTOR 2SC4213-B
Q402	8-729-209-07	s TRANSISTOR 2SC4213-B
Q405	8-729-105-37	s TRANSISTOR 2SC3360-N16
Q406	8-729-105-37	s TRANSISTOR 2SC3360-N16
Q407	8-729-209-07	s TRANSISTOR 2SC4213-B
R1	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R2	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R3	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R4	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R5	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R6	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R7	1-216-841-11	s METAL, CHIP 47K 5% 1/16W



## (AU-144P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R8	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R9	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R10	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R11	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R12	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R13	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R14	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R15	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R25	1-216-849-11 s	METAL, CHIP 220K 5% 1/16W
R26	1-216-837-11 s	METAL, CHIP 22K 5% 1/16W
R30	1-216-838-11 s	METAL, CHIP 27K 5% 1/16W
R31	1-216-838-11 s	METAL, CHIP 27K 5% 1/16W
R40	1-216-797-11 s	METAL, CHIP 10 5% 1/16W
R50	1-218-883-11 s	METAL, CHIP 33K 0.50% 1/16W
R51	1-218-883-11 s	METAL, CHIP 33K 0.50% 1/16W
R52	1-218-446-11 s	METAL, CHIP 1 5% 1/16W
R54	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R60	1-216-829-11 s	METAL, CHIP 4.7K 5% 1/16W
R63	1-216-295-00 s	METAL, CHIP 0-0HM
R64	1-216-864-11 s	METAL, CHIP 0 5% 1/16W
R66	1-218-708-11 s	METAL, CHIP 4.7K 0.50% 1/16W
R67	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R68	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R69	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R70	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R71	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R72	1-216-845-11 s	METAL, CHIP 100K 5% 1/16W
R73	1-216-829-11 s	METAL, CHIP 4.7K 5% 1/16W
R75	1-216-816-11 s	METAL, CHIP 390 5% 1/16W
R76	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R111	1-218-724-11 s	METAL, CHIP 22K 0.50% 1/16W
R112	1-218-738-11 s	METAL, CHIP 82K 0.5% 1/16W
R113	1-216-822-11 s	METAL, CHIP 1.2K 5% 1/16W
R114	1-218-741-11 s	METAL, CHIP 110K 0.5% 1/16W
R115	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R116	1-218-748-11 s	METAL, CHIP 220K 0.50% 1/16W
R117	1-216-854-11 s	METAL, CHIP 560K 5% 1/16W
R118	1-216-813-11 s	METAL, CHIP 220 5% 1/16W
R119	1-216-838-11 s	METAL, CHIP 27K 5% 1/16W
R132	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R138	1-216-813-11 s	METAL, CHIP 220 5% 1/16W
R139	1-216-841-11 s	METAL, CHIP 47K 5% 1/16W
R141	1-216-835-11 s	METAL, CHIP 15K 5% 1/16W
R142	1-216-826-11 s	METAL, CHIP 2.7K 5% 1/16W
R145	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R146	1-218-748-11 s	METAL, CHIP 220K 0.50% 1/16W
R147	1-218-740-11 s	METAL, CHIP 100K 0.50% 1/16W
R211	1-218-724-11 s	METAL, CHIP 22K 0.50% 1/16W
R212	1-218-738-11 s	METAL, CHIP 82K 0.5% 1/16W
R213	1-216-822-11 s	METAL, CHIP 1.2K 5% 1/16W
R214	1-218-741-11 s	METAL, CHIP 110K 0.5% 1/16W
R215	1-216-829-11 s	METAL, CHIP 4.7K 5% 1/16W
R216	1-218-748-11 s	METAL, CHIP 220K 0.50% 1/16W
R217	1-216-854-11 s	METAL, CHIP 560K 5% 1/16W
R218	1-216-813-11 s	METAL, CHIP 220 5% 1/16W
R219	1-216-838-11 s	METAL, CHIP 27K 5% 1/16W
R232	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R238	1-216-813-11 s	METAL, CHIP 220 5% 1/16W
R239	1-216-841-11 s	METAL, CHIP 47K 5% 1/16W

## (AU-144P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R241	1-216-835-11 s	METAL, CHIP 15K 5% 1/16W
R242	1-216-826-11 s	METAL, CHIP 2.7K 5% 1/16W
R245	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R246	1-218-748-11 s	METAL, CHIP 220K 0.50% 1/16W
R247	1-218-740-11 s	METAL, CHIP 100K 0.50% 1/16W
R301	1-216-797-11 s	METAL, CHIP 10 5% 1/16W
R302	1-216-830-11 s	METAL, CHIP 5.6K 5% 1/16W
R303	1-216-809-11 s	METAL, CHIP 100 5% 1/16W
R304	1-216-851-11 s	METAL, CHIP 330K 5% 1/16W
R305	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R306	1-218-700-11 s	METAL, CHIP 2.2K 0.50% 1/16W
R307	1-216-839-11 s	METAL, CHIP 33K 5% 1/16W
R308	1-216-817-11 s	METAL, CHIP 470 5% 1/16W
R309	1-218-708-11 s	METAL, CHIP 4.7K 0.50% 1/16W
R310	1-218-723-11 s	METAL, CHIP 20K 0.50% 1/16W
R311	1-218-697-11 s	METAL, CHIP 1.6K 0.50% 1/16W
R312	1-218-720-11 s	METAL, CHIP 15K 0.50% 1/16W
R319	1-216-809-11 s	METAL, CHIP 100 5% 1/16W
R320	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R321	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R322	1-218-723-11 s	METAL, CHIP 20K 0.50% 1/16W
R401	1-216-797-11 s	METAL, CHIP 10 5% 1/16W
R402	1-216-830-11 s	METAL, CHIP 5.6K 5% 1/16W
R403	1-216-809-11 s	METAL, CHIP 100 5% 1/16W
R404	1-216-851-11 s	METAL, CHIP 330K 5% 1/16W
R405	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R406	1-218-700-11 s	METAL, CHIP 2.2K 0.50% 1/16W
R407	1-216-839-11 s	METAL, CHIP 33K 5% 1/16W
R408	1-216-817-11 s	METAL, CHIP 470 5% 1/16W
R409	1-218-708-11 s	METAL, CHIP 4.7K 0.50% 1/16W
R410	1-218-723-11 s	METAL, CHIP 20K 0.50% 1/16W
R411	1-218-697-11 s	METAL, CHIP 1.6K 0.50% 1/16W
R412	1-218-720-11 s	METAL, CHIP 15K 0.50% 1/16W
R419	1-216-809-11 s	METAL, CHIP 100 5% 1/16W
R420	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R421	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R422	1-218-723-11 s	METAL, CHIP 20K 0.50% 1/16W
R503	1-218-484-11 s	METAL, CHIP 750 0.50% 1/16W
R506	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R507	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R508	1-218-484-11 s	METAL, CHIP 750 0.50% 1/16W
R509	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R510	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R511	1-218-484-11 s	METAL, CHIP 750 0.50% 1/16W
R512	1-216-857-11 s	METAL, CHIP 1M 5% 1/16W
R513	1-218-697-11 s	METAL, CHIP 1.6K 0.50% 1/16W
R518	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R519	1-218-716-11 s	METAL, CHIP 10K 0.50% 1/16W
R520	1-218-716-11 s	METAL, CHIP 10K 0.50% 1/16W
R521	1-218-716-11 s	METAL, CHIP 10K 0.50% 1/16W
R522	1-216-857-11 s	METAL, CHIP 1M 5% 1/16W
R523	1-218-484-11 s	METAL, CHIP 750 0.50% 1/16W
R524	1-216-829-11 s	METAL, CHIP 4.7K 5% 1/16W
R525	1-216-830-11 s	METAL, CHIP 5.6K 5% 1/16W
R526	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R603	1-218-484-11 s	METAL, CHIP 750 0.50% 1/16W
R606	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R607	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R608	1-218-484-11 s	METAL, CHIP 750 0.50% 1/16W

## (AU-144P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R609	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R610	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R611	1-218-484-11	s METAL, CHIP 750 0.50% 1/16W
R612	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R613	1-218-697-11	s METAL, CHIP 1.6K 0.50% 1/16W
R618	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R619	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R620	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R621	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R622	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R623	1-218-484-11	s METAL, CHIP 750 0.50% 1/16W
R624	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R625	1-216-830-11	s METAL, CHIP 5.6K 5% 1/16W
R626	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R702	1-218-332-11	s METAL, CHIP 130K 0.50% 1/16W
R706	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R708	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R709	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R710	1-218-313-11	s METAL, CHIP 560 1% 1/16W
R711	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R712	1-218-344-11	s METAL, CHIP 7.5K 0.50% 1/16W
R713	1-218-345-11	s METAL, CHIP 9.1K 0.50% 1/16W
R714	1-218-688-11	s METAL, CHIP 680 0.50% 1/16W
R715	1-216-295-00	s METAL, CHIP 0-OHM
R716	1-216-295-00	s METAL, CHIP 0-OHM
R717	1-216-295-00	s METAL, CHIP 0-OHM
R718	1-216-295-00	s METAL, CHIP 0-OHM
R719	1-216-295-00	s METAL, CHIP 0-OHM
R720	1-216-295-00	s METAL, CHIP 0-OHM
R721	1-216-295-00	s METAL, CHIP 0-OHM
R722	1-218-701-11	s METAL, CHIP 2.4K 0.50% 1/16W
R723	1-218-701-11	s METAL, CHIP 2.4K 0.50% 1/16W
R802	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R803	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R806	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R808	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R809	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R810	1-218-313-11	s METAL, CHIP 560 1% 1/16W
R811	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R812	1-218-344-11	s METAL, CHIP 7.5K 0.50% 1/16W
R813	1-218-345-11	s METAL, CHIP 9.1K 0.50% 1/16W
R814	1-218-688-11	s METAL, CHIP 680 0.50% 1/16W
R815	1-216-295-00	s METAL, CHIP 0-OHM
R816	1-216-295-00	s METAL, CHIP 0-OHM
R817	1-216-295-00	s METAL, CHIP 0-OHM
R818	1-216-295-00	s METAL, CHIP 0-OHM
R819	1-216-295-00	s METAL, CHIP 0-OHM
R820	1-216-295-00	s METAL, CHIP 0-OHM
R821	1-216-295-00	s METAL, CHIP 0-OHM
R822	1-218-701-11	s METAL, CHIP 2.4K 0.50% 1/16W
R823	1-218-701-11	s METAL, CHIP 2.4K 0.50% 1/16W
RV1	1-237-029-11	s RES, ADJ, METAL 50
RV101	1-237-034-11	s RES, ADJ, METAL 2K
RV111	1-237-036-11	s RES, ADJ, METAL 10K
RV112	1-237-036-11	s RES, ADJ, METAL 10K
RV113	1-237-036-11	s RES, ADJ, METAL 10K
RV201	1-237-034-11	s RES, ADJ, METAL 2K
RV211	1-237-036-11	s RES, ADJ, METAL 10K

## (AU-144P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
RV212	1-237-036-11	s RES, ADJ, METAL 10K
RV302	1-237-035-11	s RES, ADJ, METAL 5K
RV303	1-237-036-11	s RES, ADJ, METAL 10K
RV402	1-237-035-11	s RES, ADJ, METAL 5K
RV403	1-237-036-11	s RES, ADJ, METAL 10K
S1	1-571-275-31	s SWITCH, SLIDE
T1	1-459-865-11	s COIL, VARIABLE 3.4mH
T2	1-424-657-11	s TRANSFORMER, FE
TP2	1-535-877-22	o CHIP, TP
TP101	1-535-877-22	o CHIP, TP
TP102	1-535-877-22	o CHIP, TP
TP201	1-535-877-22	o CHIP, TP
TP202	1-535-877-22	o CHIP, TP
TP301	1-535-877-22	o CHIP, TP
TP302	1-535-877-22	o CHIP, TP
TP303	1-535-877-22	o CHIP, TP
TP401	1-535-877-22	o CHIP, TP
TP402	1-535-877-22	o CHIP, TP
TP403	1-535-877-22	o CHIP, TP

# CN-504 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-6754-343-A	o MOUNTED CIRCUIT BOARD, CN-504
1pc	3-171-674-01	o BRACKET, FLOATING
2pcs	7-628-254-20	s SCREW +PS 2.6X8
C1	1-164-362-11	s CERAMIC, CHIP 470PF 5% 50V
C2	1-164-362-11	s CERAMIC, CHIP 470PF 5% 50V
C3	1-126-403-11	s ELECT, CHIP 3.3uF 20% 50V
C4	1-126-403-11	s ELECT, CHIP 3.3uF 20% 50V
C5	1-162-915-11	s CERAMIC, CHIP 10PF 50V
C6	1-162-915-11	s CERAMIC, CHIP 10PF 50V
C7	1-164-005-11	s CERAMIC, CHIP 0.47uF 25V
C8	1-164-005-11	s CERAMIC, CHIP 0.47uF 25V
CN4001	1-566-581-11	s CONNECTOR, DIN 50P, FEMALE
CN4002	1-566-536-11	s CONNECTOR, 20P
CN4003	1-566-531-11	s CONNECTOR, FPC (ZIF) 15P
D1	8-719-800-76	s DIODE 1SS226
D2	8-719-800-76	s DIODE 1SS226
IC1	8-759-981-58	s IC RC2043MD
L1	1-410-380-31	s INDUCTOR, CHIP 8.2uH
L2	1-410-380-31	s INDUCTOR, CHIP 8.2uH
R1	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R2	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R3	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R4	1-218-288-11	s METAL, CHIP 300 5% 1/16W
R5	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R6	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R7	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R8	1-216-809-11	s METAL, CHIP 100 5% 1/16W

# CN-505 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-640-275-11	o PRINTED CIRCUIT BOARD, CN-505
1pc	3-171-682-01	o BRACKET, DD CONVERTER
3pcs	7-621-773-86	s SCREW +B 2.6X4
C1	1-124-563-11	s ELECT 2200uF 20% 25V
CN6001	1-564-708-11	o CONNECTOR, 6P, MALE
CN6002	1-564-709-11	o CONNECTOR, 7P, MALE
CN6003	1-566-095-11	o CONNECTOR, BB 11P, MALE
D1	8-719-908-00	s ESAC33-02CS
D2	8-719-911-55	s DIODE U05G
D3	8-719-911-55	s DIODE U05G

# CN-560 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-640-276-12	o PRINTED CIRCUIT BOARD, CN-560
C1	1-162-726-11	s CERAMIC 470PF 1% 50V
C2	1-162-726-11	s CERAMIC 470PF 1% 50V
C3	1-162-726-11	s CERAMIC 470PF 1% 50V
C4	1-162-726-11	s CERAMIC 470PF 1% 50V
CN9001	1-565-213-11	o PLUG, BB 16P, MALE
CN9002	1-506-485-11	s CONNECTOR, 6P, MALE
CN9003	1-564-708-11	o CONNECTOR, 6P, MALE
CN9004	1-573-538-11	s CONNECTOR, BB 8P, MALE
CN9005	1-565-213-11	o PLUG, BB 16P, MALE

# DUS-489 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-641-894-11	o PRINTED CIRCUIT BOARD, DUS-489
C1	1-135-149-21	s TANTALUM, CHIP 2.2uF 10% 6.3V
Q1	8-729-905-18	s TRANSISTOR DTC144EU
Q2	8-729-907-00	s TRANSISTOR DTC114EU
R1	1-216-833-11	s METAL, CHIP 10K 0.5% 1/10W

# DUS-852 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-641-735-11	o PRINTED CIRCUIT BOARD, DUS-852
C601	1-135-091-00	s TANTALUM, CHIP 1uF 20% 16V
IC601	8-759-245-04	s IC TC4S584F
IC602	8-759-209-57	s IC TC4S69F
R602	1-216-109-00	s METAL, CHIP 330K 5% 1/10W
R604	1-216-073-00	s METAL, CHIP 10K 5% 1/10W

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HP-50 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-6754-347-A	o MOUNTED CIRCUIT BOARD, HP-50
1pc	1-640-278-11	o PRINTED CIRCUIT BOARD, HP-50
C1	1-161-047-00	s CERAMIC 0.0047uF 10% 25V
C2	1-161-047-00	s CERAMIC 0.0047uF 10% 25V
CN9101	1-573-537-11	s CONNECTOR, BB 6P, MALE
J1	1-507-980-41	s JACK, MINI
R1	1-249-395-11	s CARBON 15 5% 1/4W
R2	1-249-395-11	s CARBON 15 5% 1/4W
S9101	1-570-610-11	s SWITCH, TOGGLE
S9102	1-570-610-11	s SWITCH, TOGGLE

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IO-61 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-640-277-11	o PRINTED CIRCUIT BOARD, IO-61
C1	1-161-051-00	s CERAMIC 0.01uF 10% 50V
C2	1-161-051-00	s CERAMIC 0.01uF 10% 50V
C3	1-161-051-00	s CERAMIC 0.01uF 10% 50V
CN9201	1-506-487-11	s CONNECTOR, 8P, MALE
R1	1-249-404-00	s CARBON 82 5% 1/4W

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KY-211 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-640-274-11	o PRINTED CIRCUIT BOARD, KY-211
CN1	1-565-143-11	o CONNECTOR, 10P, MALE
D1	8-719-991-17	s DIODE GL1HD111
D2	8-719-991-17	s DIODE GL1HD111
D3	8-719-991-17	s DIODE GL1HD111
R1	1-216-819-11	s METAL, CHIP 680 5% 1/16W
R2	1-216-819-11	s METAL, CHIP 680 5% 1/16W
R3	1-216-819-11	s METAL, CHIP 680 5% 1/16W
S1	1-570-909-11	s SWITCH, TACTIL (REFLOW TYPE)
S2	1-570-909-11	s SWITCH, TACTIL (REFLOW TYPE)
S3	1-570-909-11	s SWITCH, TACTIL (REFLOW TYPE)
S4	1-570-909-11	s SWITCH, TACTIL (REFLOW TYPE)
S5	1-570-909-11	s SWITCH, TACTIL (REFLOW TYPE)

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MB-362 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-6754-344-A	o MOUNTED CIRCUIT BOARD, MB-362
1pc	3-171-675-01	o BRACKET (A), MB
2pcs	3-703-502-41	s SCREW
CN101	1-566-520-11	s CONNECTOR, FPC 20P
CN102	1-566-515-11	s CONNECTOR, FPC 15P
CN103	1-573-727-11	s CONNECTOR, FPC 25P
CN104	1-506-730-11	o CONNECTOR, 40P, MALE
CN105	1-568-077-11	s CONNECTOR, 16P, FEMALE
CN106	1-568-079-11	s CONNECTOR, 20P, FEMALE
CN107	1-506-468-11	s CONNECTOR, 3P, MALE
CN108	1-506-469-11	s CONNECTOR, 4P, MALE
CN109	1-506-473-11	s CONNECTOR, 8P, MALE

# MB-363 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-6754-345-A	o MOUNTED CIRCUIT BOARD, MB-363
1pc	3-172-695-01	o HOLDER, CN
1pc	3-171-677-01	o SUPPORT, HEXAGON
1pc	3-171-676-01	o BRACKET (B), MB
3pcs	7-621-773-86	s SCREW +B 2.6X4
C1	1-125-309-00	s DOUBLE LAYERS 0.33FARAD 5.5V
C2	1-124-557-11	s ELECT 1000uF 20% 25V
CN1	1-566-516-11	s CONNECTOR, FPC 16P
CN2	1-565-209-11	s CONNECTOR, FPC 26P, FEMALE
CN3	1-506-487-11	s CONNECTOR, 8P, MALE
CN4	1-506-484-11	s CONNECTOR, 5P, MALE
CN5	1-564-707-11	o CONNECTOR, 5P, MALE
CN6	1-506-482-11	s CONNECTOR, 3P, MALE
CN7	1-564-725-11	s CONNECTOR, 9P, MALE
CN8	1-569-335-11	s CONNECTOR, BB 9P, MALE
CN9	1-565-214-11	o SOCKET, BB 16P, FEMALE
CN10	1-573-727-11	s CONNECTOR, FPC 25P
CN11	1-565-214-11	o SOCKET, BB 16P, FEMALE
CN12	1-506-473-11	s CONNECTOR, 8P, MALE

# SE-60 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-569-193-11	o CONTACT, FEMALE
1pc	1-622-630-11	o PRINTED CIRCUIT BOARD, SE-60
CN107	1-569-196-11	o HOUSING, 3P
PH1	8-719-907-32	s PHOTO INTERRUPTER GP-1104
R1	1-249-412-11	s CARBON 390 5% 1/4W

# SE-164 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-564-831-11	o CONTACT, FEMALE
1pc	1-568-030-11	o CONTACT, FEMALE
1pc	1-569-193-11	o CONTACT, FEMALE
1pc	1-573-745-11	o HOUSING, 2P
1pc	1-640-284-11	o PRINTED CIRCUIT BOARD, SE-164
CN2	1-806-682-81	s SENSOR, CONDENSATION
CN1003	1-569-200-11	o HOUSING, 7P

# SS-46P BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-6715-457-A	o MOUNTED CIRCUIT BOARD, SS-46P
2pcs	3-171-681-01	o HOLDER, GP2S09
C1	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C2	1-162-957-11	s CERAMIC, CHIP 220PF 5% 50V
C3	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C4	1-126-394-11	s ELECT, CHIP 10uF 20% 16V
C5	1-126-401-11	s ELECT, CHIP 1uF 20% 50V
C6	1-126-398-11	s ELECT, CHIP 4.7uF 20% 35V
C8	1-162-917-11	s CERAMIC, CHIP 15PF 5% 50V
C9	1-162-917-11	s CERAMIC, CHIP 15PF 5% 50V
C10	1-162-975-11	s CERAMIC, CHIP 24PF 5% 50V
C11	1-162-975-11	s CERAMIC, CHIP 24PF 5% 50V
C13	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C14	1-162-964-11	s CERAMIC, CHIP 0.001uF 10% 50V
C15	1-162-964-11	s CERAMIC, CHIP 0.001uF 10% 50V
C16	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C17	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C18	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
C19	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C20	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
C21	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
C23	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C24	1-162-964-11	s CERAMIC, CHIP 0.001uF 10% 50V
C25	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C26	1-162-964-11	s CERAMIC, CHIP 0.001uF 10% 50V
C141	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C151	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C152	1-126-390-11	s ELECT, CHIP 22uF 20% 6.3V
C154	1-126-390-11	s ELECT, CHIP 22uF 20% 6.3V
C155	1-126-390-11	s ELECT, CHIP 22uF 20% 6.3V
C156	1-126-390-11	s ELECT, CHIP 22uF 20% 6.3V
C157	1-126-390-11	s ELECT, CHIP 22uF 20% 6.3V
C159	1-124-478-11	s ELECT 100uF 20% 25V
C160	1-164-227-11	s CERAMIC, CHIP 0.02uF 10% 25V
C161	1-164-227-11	s CERAMIC, CHIP 0.02uF 10% 25V
C162	1-164-227-11	s CERAMIC, CHIP 0.02uF 10% 25V
C163	1-126-398-11	s ELECT, CHIP 4.7uF 20% 35V
C164	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C201	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C202	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C203	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C204	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C205	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C206	1-164-677-11	s CERAMIC, CHIP 0.03uF 10% 16V
C207	1-162-967-11	s CERAMIC, CHIP 0.003uF 10% 50V
C208	1-135-211-11	s TANTALUM, CHIP 6.8uF 20% 6.3V
C209	1-135-211-11	s TANTALUM, CHIP 6.8uF 20% 6.3V
C210	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C211	1-162-963-11	s CERAMIC, CHIP 680PF 10% 50V
C212	1-162-959-11	s CERAMIC, CHIP 330PF 5% 50V
C213	1-163-809-11	s CERAMIC, CHIP 0.04uF 10% 25V
C214	1-162-969-11	s CERAMIC, CHIP 0.008uF 10% 25V
C215	1-162-968-11	s CERAMIC, CHIP 0.0047uF 10% 50V
C216	1-126-630-11	s ELECT 82uF 20% 25V
C217	1-162-965-11	s CERAMIC, CHIP 0.005uF 10% 50V
C218	1-163-809-11	s CERAMIC, CHIP 0.04uF 10% 25V
C219	1-162-966-11	s CERAMIC, CHIP 0.002uF 10% 50V

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Ref. No. or Q'ty	Part No.	SP Description
C220	1-162-968-11	s CERAMIC, CHIP 0.0047uF 10% 50V
C221	1-126-630-11	s ELECT 82uF 20% 25V
C222	1-162-957-11	s CERAMIC, CHIP 220PF 5% 50V
C223	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C224	1-162-964-11	s CERAMIC, CHIP 0.001uF 10% 50V
C225	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C226	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
C227	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
C228	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C229	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C230	1-162-964-11	s CERAMIC, CHIP 0.001uF 10% 50V
C231	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C233	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C234	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C235	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C236	1-162-968-11	s CERAMIC, CHIP 0.0047uF 10% 50V
C237	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C238	1-126-390-11	s ELECT, CHIP 22uF 20% 6.3V
C239	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C240	1-162-964-11	s CERAMIC, CHIP 0.001uF 10% 50V
C241	1-162-966-11	s CERAMIC, CHIP 0.0022uF 10% 50V
C242	1-162-966-11	s CERAMIC, CHIP 0.0022uF 10% 50V
C243	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C244	1-126-630-11	s ELECT 82uF 20% 25V
C245	1-124-489-11	s ELECT 150uF 20% 25V
C263	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C401	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C402	1-162-968-11	s CERAMIC, CHIP 0.0047uF 10% 50V
C403	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C404	1-162-966-11	s CERAMIC, CHIP 0.0022uF 10% 50V
C405	1-162-968-11	s CERAMIC, CHIP 0.0047uF 10% 50V
C406	1-163-207-00	s CERAMIC 0.0012uF 5% 50V
C407	1-126-390-11	s ELECT, CHIP 22uF 20% 6.3V
C408	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C409	1-162-969-11	s CERAMIC, CHIP 0.0068uF 10% 25V
C410	1-162-965-11	s CERAMIC, CHIP 0.0015uF 10% 50V
C411	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C412	1-126-630-11	s ELECT 82uF 20% 25V
C413	1-162-968-11	s CERAMIC, CHIP 0.0047uF 10% 50V
C415	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
C416	1-126-630-11	s ELECT 82uF 20% 25V
C417	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C501	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C502	1-162-957-11	s CERAMIC, CHIP 220PF 5% 50V
C503	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C504	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C505	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C506	1-162-957-11	s CERAMIC, CHIP 220PF 5% 50V
C507	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C508	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C509	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C510	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C511	1-124-343-00	s ELECT 2200uF 20% 16V
C512	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C513	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C514	1-124-478-11	s ELECT 100uF 20% 25V
C515	1-124-343-00	s ELECT 2200uF 20% 16V
C516	1-164-146-11	s CERAMIC, CHIP 0.0033uF 10% 50V
C517	1-164-146-11	s CERAMIC, CHIP 0.0033uF 10% 50V

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Ref. No. or Q'ty	Part No.	SP Description
C518	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C601	1-135-091-00	s TANTALUM, CHIP 1uF 10% 16V
CN1	1-562-773-11	o CONNECTOR, 40P, FEMALE
CN2	1-506-478-11	s CONNECTOR, 13P, MALE
CN3	1-506-472-11	s CONNECTOR, 7P, MALE
CN4	1-506-467-11	s CONNECTOR, 2P, MALE
CN5	1-506-467-11	s CONNECTOR, 2P, MALE
CN6	1-565-143-11	o CONNECTOR, 10P, MALE
CN7	1-506-467-11	s CONNECTOR, 2P, MALE
CN101	1-506-467-11	s CONNECTOR, 2P, MALE
CN102	1-506-467-11	s CONNECTOR, 2P, MALE
CN103	1-506-468-11	s CONNECTOR, 3P, MALE
CN201	1-506-469-11	s CONNECTOR, 4P, MALE
CN202	1-506-467-11	s CONNECTOR, 2P, MALE
CN203	1-506-474-11	s CONNECTOR, 9P, MALE
CN204	1-506-468-11	s CONNECTOR, 3P, MALE
CN205	1-506-467-11	s CONNECTOR, 2P, MALE
CN206	1-580-536-11	s CONNECTOR, 14P, MALE
D1	8-719-941-09	s DIODE DAP202U
D2	8-719-105-52	s DIODE RD3.6M-B2
D105	8-719-106-17	s DIODE RD6.8M-B2
D202	8-719-941-09	s DIODE DAP202U
D204	8-719-106-89	s DIODE RD15M-B2
D205	8-719-981-01	s DIODE ERA81-004
D206	8-719-981-01	s DIODE ERA81-004
D207	8-719-981-01	s DIODE ERA81-004
D401	8-719-941-86	s DIODE DAN202U
D402	8-719-941-09	s DIODE DAP202U
D403	8-719-981-01	s DIODE ERA81-004
D501	8-719-941-09	s DIODE DAP202U
D502	8-719-941-86	s DIODE DAN202U
D503	8-719-200-02	s DIODE 10E2
D504	8-719-941-86	s DIODE DAN202U
D505	8-719-200-02	s DIODE 10E2
D506	8-719-200-02	s DIODE 10E2
D507	8-719-941-86	s DIODE DAN202U
D508	8-719-941-86	s DIODE DAN202U
D509	8-719-106-45	s DIODE RD9.1M-B3
E1	1-535-877-22	o CHIP, TP
E2	1-535-877-22	o CHIP, TP
E3	1-535-877-22	o CHIP, TP
IC1	8-752-835-49	s IC CXP80624-264Q
IC2	8-759-518-79	s IC MB88325PF
IC3	8-759-981-65	s IC LM2903M
IC4	8-759-940-45	s IC S-8054HN-CB
IC5	8-759-009-51	s IC MC14538BF
IC6	8-759-925-80	s IC SN74HC14NS
IC7	8-759-925-74	s IC TC74HC04NS
IC12	8-759-009-51	s IC MC14538BF
IC13	8-759-008-82	s IC MC14013BF
IC14	8-759-009-51	s IC MC14538BF
IC15	8-759-209-57	s IC TC4S69F
IC16	8-759-008-79	s IC MC14011BF
IC17	8-759-234-13	s IC TC4S30F
IC103	8-759-948-05	s IC BA6229
IC104	8-759-150-61	s IC UPC78L05T
IC201	8-752-835-48	s IC CXP80624-265Q

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Ref. No. or Q'ty	Part No.	SP Description
IC202	8-759-981-92	s IC RC4558M
IC203	8-759-981-92	s IC RC4558M
IC205	8-759-981-92	s IC RC4558M
IC206	8-759-008-82	s IC MC14013BF
IC207	8-759-234-13	s IC TC4S30F
IC209	8-759-300-71	s IC HD14053BFP
IC210	8-759-111-56	s IC UPC4572G2
IC211	8-759-981-65	s IC LM2903M
IC212	8-759-209-57	s IC TC4S69F
IC213	8-759-981-61	s IC LM2901M
IC214	8-759-100-94	s IC UPC358G2
IC216	8-759-300-71	s IC HD14053BFP
IC217	8-759-100-95	s IC UPC324G2
IC218	8-759-205-56	s IC TA7267P
IC401	8-759-981-61	s IC LM2901M
IC402	8-759-008-79	s IC MC14011BF
IC403	8-759-209-57	s IC TC4S69F
IC501	8-759-805-32	s IC LA7205M
IC502	8-759-805-32	s IC LA7205M
IC504	8-759-209-69	s IC TC4S11F
IC601	8-759-245-04	s IC TC4S584F
IC602	8-759-209-57	s IC TC4S69F
L1	1-408-773-31	s INDUCTOR, CHIP 4.7uH
L101	1-408-773-31	s INDUCTOR, CHIP 4.7uH
L102	1-408-773-31	s INDUCTOR, CHIP 4.7uH
L104	1-408-773-31	s INDUCTOR, CHIP 4.7uH
L105	1-408-773-31	s INDUCTOR, CHIP 4.7uH
L151	1-412-533-11	s INDUCTOR 47uH
L152	1-410-393-11	s INDUCTOR, CHIP 100uH
L201	1-424-517-11	s COIL, CHOKE 200uH
L202	1-424-517-11	s COIL, CHOKE 200uH
L203	1-412-533-11	s INDUCTOR 47uH
L401	1-424-517-11	s COIL, CHOKE 200uH
PH1	8-719-939-11	s PHOTO INTERRUPTER GP-2S09-B
PH2	8-719-939-11	s PHOTO INTERRUPTER GP-2S09-B
Q1	8-729-905-18	s TRANSISTOR DTC144EU
Q2	8-729-905-18	s TRANSISTOR DTC144EU
Q3	8-729-906-33	s TRANSISTOR DTC114YU
Q4	8-729-905-12	s TRANSISTOR DTA144EU
Q5	8-729-905-18	s TRANSISTOR DTC144EU
Q6	8-729-117-32	s TRANSISTOR 2SC4177
Q7	8-729-117-32	s TRANSISTOR 2SC4177
Q8	8-729-117-32	s TRANSISTOR 2SC4177
Q9	8-729-905-18	s TRANSISTOR DTC144EU
Q10	8-729-905-18	s TRANSISTOR DTC144EU
Q11	8-729-905-18	s TRANSISTOR DTC144EU
Q12	8-729-117-32	s TRANSISTOR 2SC4177
Q13	8-729-117-32	s TRANSISTOR 2SC4177
Q14	8-729-905-18	s TRANSISTOR DTC144EU
Q15	8-729-905-18	s TRANSISTOR DTC144EU
Q151	8-729-106-68	s TRANSISTOR 2SC1615A-GP
Q152	8-729-106-68	s TRANSISTOR 2SC1615A-GP
Q201	8-729-209-07	s TRANSISTOR 2SC4213-B
Q202	8-729-117-32	s TRANSISTOR 2SC4177
Q203	8-729-117-32	s TRANSISTOR 2SC4177
Q204	8-729-220-93	s TRANSISTOR 2SK209-G

## (SS-46P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
Q205	8-729-117-32	s TRANSISTOR 2SC4177
Q206	8-729-106-68	s TRANSISTOR 2SC1615A-GP
Q208	8-729-209-01	s TRANSISTOR 2SB907
Q209	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q210	8-729-807-50	s TRANSISTOR 2SD1623
Q211	8-729-117-32	s TRANSISTOR 2SC4177
Q212	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q213	8-729-106-68	s TRANSISTOR 2SC1615A-GP
Q214	8-729-143-63	s TRANSISTOR 2SJ132
Q215	8-729-117-32	s TRANSISTOR 2SC4177
Q401	8-729-209-01	s TRANSISTOR 2SB907
Q402	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q403	8-729-807-50	s TRANSISTOR 2SD1623
Q501	8-729-905-12	s TRANSISTOR DTA144EU
Q502	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q503	8-729-117-32	s TRANSISTOR 2SC4177
Q504	8-729-116-42	s TRANSISTOR 2SD1164-L
Q505	8-729-116-42	s TRANSISTOR 2SD1164-L
Q506	8-729-905-12	s TRANSISTOR DTA144EU
Q507	8-729-905-18	s TRANSISTOR DTC144EU
Q508	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q509	8-729-116-42	s TRANSISTOR 2SD1164-L
Q510	8-729-905-12	s TRANSISTOR DTA144EU
Q511	8-729-905-12	s TRANSISTOR DTA144EU
R1	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R2	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R3	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R4	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R5	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R6	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R7	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R8	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R9	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R10	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R11	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R12	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R13	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R14	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R15	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R16	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R17	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R18	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R19	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R20	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R21	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R22	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R23	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R24	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R25	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R26	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R27	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R28	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R29	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R30	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R31	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R32	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R33	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R34	1-216-821-11	s METAL, CHIP 1K 5% 1/16W



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Ref. No. or Q'ty	Part No.	SP Description
R35	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R36	1-218-727-11	s METAL, CHIP 30K 0.50% 1/16W
R37	1-216-820-11	s METAL, CHIP 820 5% 1/16W
R38	1-216-846-11	s METAL, CHIP 120K 5% 1/16W
R39	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R40	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R41	1-216-854-11	s METAL, CHIP 560K 5% 1/16W
R42	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R43	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R44	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R45	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R46	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R47	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R48	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R49	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R50	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R51	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R52	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R53	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R54	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R55	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R56	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R57	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R58	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R59	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R60	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R61	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R62	1-216-819-11	s METAL, CHIP 680 5% 1/16W
R63	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R64	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R65	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R66	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R67	1-216-815-11	s METAL, CHIP 330 5% 1/16W
R68	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R69	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R70	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R71	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R72	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R73	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R74	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R75	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R76	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R77	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R78	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R79	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R80	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R81	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R82	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R83	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R84	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R85	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R86	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R87	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R88	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R89	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R90	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R91	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R92	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R93	1-216-841-11	s METAL, CHIP 47K 5% 1/16W

## (SS-46P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R94	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R95	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R96	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R97	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R98	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R99	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R100	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R101	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R102	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R103	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R104	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R105	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R106	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R107	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R108	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R109	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R110	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R111	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R112	1-216-847-11	s METAL, CHIP 150K 5% 1/16W
R113	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R114	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R115	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R116	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R117	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R118	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R119	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R120	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R121	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R122	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R123	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R124	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R125	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R126	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R127	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R128	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R129	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R130	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R131	1-216-311-00	s METAL, CHIP 6.8 5% 1/10W
R132	1-216-311-00	s METAL, CHIP 6.8 5% 1/10W
R133	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R134	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R135	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R136	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R137	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R151	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R152	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R201	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R202	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R203	1-216-851-11	s METAL, CHIP 330K 5% 1/16W
R204	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R205	1-216-851-11	s METAL, CHIP 330K 5% 1/16W
R206	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R207	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R208	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R209	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R210	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R211	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R212	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R213	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W



## (SS-46P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R214	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R215	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R216	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R217	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R218	1-216-851-11	s METAL, CHIP 330K 5% 1/16W
R219	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R220	1-216-851-11	s METAL, CHIP 330K 5% 1/16W
R221	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R222	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R223	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R224	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R225	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R226	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R227	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R228	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R229	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R230	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R231	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R232	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R233	1-216-855-11	s METAL, CHIP 680K 5% 1/16W
R234	1-216-855-11	s METAL, CHIP 680K 5% 1/16W
R235	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R236	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R237	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R238	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R239	1-216-818-11	s METAL, CHIP 560 5% 1/16W
R240	1-216-852-11	s METAL, CHIP 390K 5% 1/16W
R241	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R242	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R243	1-216-852-11	s METAL, CHIP 390K 5% 1/16W
R244	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R245	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R246	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R247	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R248	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R249	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R250	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R251	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R252	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R253	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R254	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R255	1-216-854-11	s METAL, CHIP 560K 5% 1/16W
R256	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R257	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R258	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R259	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R260	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R261	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R262	1-216-840-11	s METAL, CHIP 39K 5% 1/16W
R263	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R264	1-216-830-11	s METAL, CHIP 5.6K 5% 1/16W
R265	1-216-822-11	s METAL, CHIP 1.2K 5% 1/16W
R266	1-216-843-11	s METAL, CHIP 68K 5% 1/16W
R267	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R268	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R269	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R270	1-216-832-11	s METAL, CHIP 8.2K 5% 1/16W
R271	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R272	1-216-839-11	s METAL, CHIP 33K 5% 1/16W

## (SS-46P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R273	1-218-740-11	s METAL, CHIP 100K 0.50% 1/16W
R275	1-218-740-11	s METAL, CHIP 100K 0.50% 1/16W
R276	1-218-746-11	s METAL, CHIP 180K 0.50% 1/16W
R277	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R278	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R279	1-218-883-11	s METAL, CHIP 33K 0.50% 1/16W
R280	1-216-844-11	s METAL, CHIP 82K 5% 1/16W
R281	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R282	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R283	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R284	1-218-748-11	s METAL, CHIP 220K 0.50% 1/16W
R285	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R286	1-216-345-11	s METAL, CHIP 0.47 5% 1W
R287	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R288	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R289	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R290	1-218-295-11	s METAL, CHIP 4.3K 5% 1/16W
R291	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R292	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R293	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R294	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R295	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R296	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R297	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R299	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R300	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R301	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R302	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R303	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R304	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R305	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R306	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R307	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R308	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R309	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R310	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R311	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R312	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R313	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R314	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R315	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R316	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R317	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R318	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R319	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R320	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R321	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R322	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R323	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R324	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R325	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R326	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R327	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R328	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R329	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R330	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R331	1-218-740-11	s METAL, CHIP 100K 0.50% 1/16W
R333	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R334	1-216-821-11	s METAL, CHIP 1K 5% 1/16W

## (SS-46P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R347	1-216-835-11 s	METAL, CHIP 15K 5% 1/16W
R348	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R349	1-216-829-11 s	METAL, CHIP 4.7K 5% 1/16W
R350	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R352	1-216-864-11 s	METAL, CHIP 0 5% 1/16W
R401	1-216-829-11 s	METAL, CHIP 4.7K 5% 1/16W
R402	1-216-845-11 s	METAL, CHIP 100K 5% 1/16W
R403	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R404	1-216-853-11 s	METAL, CHIP 470K 5% 1/16W
R405	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R406	1-216-829-11 s	METAL, CHIP 4.7K 5% 1/16W
R407	1-216-845-11 s	METAL, CHIP 100K 5% 1/16W
R408	1-216-831-11 s	METAL, CHIP 6.8K 5% 1/16W
R409	1-216-853-11 s	METAL, CHIP 470K 5% 1/16W
R410	1-216-829-11 s	METAL, CHIP 4.7K 5% 1/16W
R411	1-216-841-11 s	METAL, CHIP 47K 5% 1/16W
R412	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R413	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R414	1-218-740-11 s	METAL, CHIP 100K 0.50% 1/16W
R415	1-218-740-11 s	METAL, CHIP 100K 0.50% 1/16W
R416	1-216-845-11 s	METAL, CHIP 100K 5% 1/16W
R417	1-216-836-11 s	METAL, CHIP 18K 5% 1/16W
R418	1-216-839-11 s	METAL, CHIP 33K 5% 1/16W
R419	1-216-837-11 s	METAL, CHIP 22K 5% 1/16W
R420	1-216-840-11 s	METAL, CHIP 39K 5% 1/16W
R421	1-216-836-11 s	METAL, CHIP 18K 5% 1/16W
R422	1-216-843-11 s	METAL, CHIP 68K 5% 1/16W
R423	1-216-823-11 s	METAL, CHIP 1.5K 5% 1/16W
R424	1-216-822-11 s	METAL, CHIP 1.2K 5% 1/16W
R425	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R426	1-216-827-11 s	METAL, CHIP 3.3K 5% 1/16W
R427	1-216-831-11 s	METAL, CHIP 6.8K 5% 1/16W
R428	1-216-839-11 s	METAL, CHIP 33K 5% 1/16W
R429	1-216-827-11 s	METAL, CHIP 3.3K 5% 1/16W
R430	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R431	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R432	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R433	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R434	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R435	1-216-830-11 s	METAL, CHIP 5.6K 5% 1/16W
R436	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R437	1-216-823-11 s	METAL, CHIP 1.5K 5% 1/16W
R501	1-216-804-11 s	METAL, CHIP 39 5% 1/16W
R502	1-216-841-11 s	METAL, CHIP 47K 5% 1/16W
R503	1-218-883-11 s	METAL, CHIP 33K 0.50% 1/16W
R504	1-216-841-11 s	METAL, CHIP 47K 5% 1/16W
R505	1-216-857-11 s	METAL, CHIP 1M 5% 1/16W
R506	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R507	1-216-845-11 s	METAL, CHIP 100K 5% 1/16W
R508	1-216-817-11 s	METAL, CHIP 470 5% 1/16W
R509	1-216-841-11 s	METAL, CHIP 47K 5% 1/16W
R510	1-216-837-11 s	METAL, CHIP 22K 5% 1/16W
R511	1-216-817-11 s	METAL, CHIP 470 5% 1/16W
R512	1-216-837-11 s	METAL, CHIP 22K 5% 1/16W
R513	1-216-857-11 s	METAL, CHIP 1M 5% 1/16W
R514	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R515	1-216-845-11 s	METAL, CHIP 100K 5% 1/16W
R516	1-216-817-11 s	METAL, CHIP 470 5% 1/16W
R517	1-216-817-11 s	METAL, CHIP 470 5% 1/16W

## (SS-46P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R518	1-216-841-11 s	METAL, CHIP 47K 5% 1/16W
R519	1-216-837-11 s	METAL, CHIP 22K 5% 1/16W
R520	1-216-817-11 s	METAL, CHIP 470 5% 1/16W
R521	1-216-818-11 s	METAL, CHIP 560 5% 1/16W
R522	1-216-849-11 s	METAL, CHIP 220K 5% 1/16W
R602	1-216-851-11 s	METAL, CHIP 330K 5% 1/16W
R604	1-216-833-11 s	METAL, CHIP 10K 5% 1/16W
R605	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R606	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
RV4	1-237-040-11 s	RES, ADJ METAL 200K
RV5	1-237-040-11 s	RES, ADJ METAL 200K
RV201	1-237-035-11 s	RES, ADJ METAL 5K
RV202	1-237-035-11 s	RES, ADJ METAL 5K
RV203	1-237-036-11 s	RES, ADJ METAL 10K
RV204	1-237-040-11 s	RES, ADJ METAL 200K
RV205	1-237-040-11 s	RES, ADJ METAL 200K
RV206	1-237-040-11 s	RES, ADJ METAL 200K
S1	1-572-719-11 s	SWITCH, PUSH
S2	1-572-719-11 s	SWITCH, PUSH
S3	1-572-719-11 s	SWITCH, PUSH
S4	1-572-719-11 s	SWITCH, PUSH
S5	1-571-275-31 s	SWITCH, SLIDE
SP1	1-566-388-11 s	CONNECTOR 8P, MALE
TH1	1-808-656-11 s	THERMISTOR
TP1	1-535-877-22 o	CHIP, TP
TP2	1-535-877-22 o	CHIP, TP
TP3	1-535-877-22 o	CHIP, TP
TP4	1-535-877-22 o	CHIP, TP
TP5	1-535-877-22 o	CHIP, TP
TP6	1-535-877-22 o	CHIP, TP
TP7	1-535-877-22 o	CHIP, TP
TP14	1-535-877-22 o	CHIP, TP
TP15	1-535-877-22 o	CHIP, TP
TP16	1-535-877-22 o	CHIP, TP
TP17	1-535-877-22 o	CHIP, TP
TP18	1-535-877-22 o	CHIP, TP
TP19	1-535-877-22 o	CHIP, TP
TP20	1-535-877-22 o	CHIP, TP
TP103	1-535-877-22 o	CHIP, TP
TP201	1-535-877-22 o	CHIP, TP
TP202	1-535-877-22 o	CHIP, TP
TP203	1-535-877-22 o	CHIP, TP
TP204	1-535-877-22 o	CHIP, TP
TP205	1-535-877-22 o	CHIP, TP
TP206	1-535-877-22 o	CHIP, TP
TP207	1-535-877-22 o	CHIP, TP
TP208	1-535-877-22 o	CHIP, TP
TP209	1-535-877-22 o	CHIP, TP
TP210	1-535-877-22 o	CHIP, TP
TP211	1-535-877-22 o	CHIP, TP
TP212	1-535-877-22 o	CHIP, TP
TP214	1-535-877-22 o	CHIP, TP
TP215	1-535-877-22 o	CHIP, TP
TP216	1-535-877-22 o	CHIP, TP
TP218	1-535-877-22 o	CHIP, TP
TP401	1-535-877-22 o	CHIP, TP
TP402	1-535-877-22 o	CHIP, TP

## (SS-46P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
TP403	1-535-877-22	o CHIP, TP
TP404	1-535-877-22	o CHIP, TP
TP406	1-535-877-22	o CHIP, TP
X1	1-567-885-11	s CRYSTAL 12.0MHz
X2	1-579-458-11	s CRYSTAL 17.734475MHz
X201	1-567-885-11	s CRYSTAL 12.0MHz

## SW-457 BOARD

Ref. No. or Q'ty	Part No.	SP Description
lpc	1-569-193-11	o CONTACT, FEMALE
lpc	1-640-282-11	o PRINTED CIRCUIT BOARD, SW-457
lpc	3-670-095-00	o HOLDER, LED
CN1005	1-569-195-31	o HOUSING, 2P
D1	8-719-902-27	s DIODE EBR3402S
S1	1-570-608-11	s SWITCH, TOGGLE

## SW-474 BOARD

Ref. No. or Q'ty	Part No.	SP Description
lpc	1-640-279-11	o PRINTED CIRCUIT BOARD, SW-474
CB1	1-532-525-00	s BREAKER, CIRCUIT 6.3A 125V
CN6004	1-564-704-11	o PIN HEADER, STRAIGHT 2P

## TC-60P BOARD

Ref. No. or Q'ty	Part No.	SP Description
lpc	A-6713-470-A	o MOUNTED CIRCUIT BOARD, TC-60P
lpc	3-171-678-01	o HOLDER, LCD
lpc	3-171-679-01	o HOLDER, LED
C1	1-135-210-11	s TANTALUM, CHIP 4.7uF 20% 10V
C2	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
C3	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
C5	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C6	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C7	1-162-952-11	s CERAMIC, CHIP 82PF 5% 50V
C8	1-164-315-11	s CERAMIC, CHIP 470PF 10% 50V
C9	1-135-166-21	s TANTALUM, CHIP 47uF 10% 10V
C101	1-164-315-11	s CERAMIC, CHIP 470PF 10% 50V
C102	1-164-315-11	s CERAMIC, CHIP 470PF 10% 50V
C103	1-128-049-11	s ELECT 1uF 50V
C104	1-128-049-11	s ELECT 1uF 50V
C105	1-128-049-11	s ELECT 1uF 50V
C106	1-162-941-11	s CERAMIC, CHIP 10PF 50V
C107	1-162-941-11	s CERAMIC, CHIP 10PF 50V
C108	1-135-161-21	s TANTALUM, CHIP 22uF 10% 10V
C109	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C110	1-162-949-11	s CERAMIC, CHIP 47PF 5% 50V
C111	1-135-210-11	s TANTALUM, CHIP 4.7uF 20% 10V
C112	1-135-157-21	s TANTALUM 10uF 10% 6.3V
C113	1-135-166-21	s TANTALUM, CHIP 47uF 10% 10V
C115	1-135-157-21	s TANTALUM 10uF 10% 6.3V
C116	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C117	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C118	1-162-965-11	s CERAMIC, CHIP 0.0015uF 10% 50V
C119	1-163-137-00	s CERAMIC, CHIP 680PF 5% 50V
C201	1-164-315-11	s CERAMIC, CHIP 470PF 10% 50V
C202	1-164-315-11	s CERAMIC, CHIP 470PF 10% 50V
C203	1-128-049-11	s ELECT 1uF 50V
C204	1-128-049-11	s ELECT 1uF 50V
C205	1-128-049-11	s ELECT 1uF 50V
C206	1-162-941-11	s CERAMIC, CHIP 10PF 50V
C207	1-162-941-11	s CERAMIC, CHIP 10PF 50V
C208	1-135-161-21	s TANTALUM, CHIP 22uF 10% 10V
C209	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C210	1-162-949-11	s CERAMIC, CHIP 47PF 5% 50V
C211	1-135-210-11	s TANTALUM, CHIP 4.7uF 20% 10V
C212	1-135-157-21	s TANTALUM 10uF 10% 6.3V
C213	1-135-166-21	s TANTALUM, CHIP 47uF 10% 10V
C214	1-135-161-21	s TANTALUM, CHIP 22uF 10% 10V
C215	1-135-157-21	s TANTALUM 10uF 10% 6.3V
C216	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C217	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C218	1-162-965-11	s CERAMIC, CHIP 0.0015uF 10% 50V
C219	1-163-137-00	s CERAMIC, CHIP 680PF 5% 50V
C303	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C304	1-135-157-21	s TANTALUM 10uF 10% 6.3V
C306	1-135-180-21	s TANTALUM 33uF 10% 10V
C403	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C404	1-135-157-21	s TANTALUM 10uF 10% 6.3V
C406	1-135-180-21	s TANTALUM 33uF 10% 10V
C500	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C501	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C502	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C503	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V

## (TC-60P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
C504	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C505	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C506	1-135-210-11	s TANTALUM, CHIP 4.7uF 20% 10V
C507	1-135-210-11	s TANTALUM, CHIP 4.7uF 20% 10V
C508	1-125-447-11	s DOUBLE LAYERS 1FARAD 5.5V
C511	1-135-210-11	s TANTALUM, CHIP 4.7uF 20% 10V
C512	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C513	1-164-156-11	s CERAMIC, CHIP 0.1uF 25V
C514	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C515	1-135-073-00	s TANTALUM, CHIP 0.33uF 10% 35V
C516	1-135-210-11	s TANTALUM, CHIP 4.7uF 20% 10V
C517	1-135-073-00	s TANTALUM, CHIP 0.33uF 10% 35V
C518	1-135-089-21	s TANTALUM, CHIP 6.8uF 10% 20V
C519	1-164-315-11	s CERAMIC, CHIP 470PF 10% 50V
C520	1-164-315-11	s CERAMIC, CHIP 470PF 10% 50V
C522	1-135-164-21	s TANTALUM, CHIP 22uF 10% 16V
C523	1-162-921-11	s CERAMIC, CHIP 33PF 5% 50V
C524	1-162-921-11	s CERAMIC, CHIP 33PF 5% 50V
C525	1-162-921-11	s CERAMIC, CHIP 33PF 5% 50V
C526	1-163-275-11	s CERAMIC, CHIP 0.001uF 5% 50V
C527	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C528	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C529	1-135-210-11	s TANTALUM, CHIP 4.7uF 20% 10V
C530	1-135-210-11	s TANTALUM, CHIP 4.7uF 20% 10V
C531	1-163-137-00	s CERAMIC, CHIP 680PF 5% 50V
C532	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C533	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C534	1-162-949-11	s CERAMIC, CHIP 47PF 5% 50V
C535	1-135-166-21	s TANTALUM, CHIP 47uF 10% 10V
C536	1-163-143-00	s CERAMIC, CHIP 0.0012uF 5% 50V
C537	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C538	1-135-166-21	s TANTALUM, CHIP 47uF 10% 10V
C539	1-164-473-11	s CERAMIC, CHIP 820PF 5% 50V
C540	1-135-166-21	s TANTALUM, CHIP 47uF 10% 10V
C541	1-162-960-11	s CERAMIC, CHIP 220PF 10% 50V
C542	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C543	1-162-568-11	s CERAMIC, CHIP 0.33uF 25V
C701	1-135-161-21	s TANTALUM, CHIP 22uF 10% 10V
C702	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C703	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C704	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C705	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C706	1-135-210-11	s TANTALUM, CHIP 4.7uF 20% 10V
C707	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C708	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C709	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C710	1-126-412-11	s ELECT, CHIP 220uF 20% 4V
C714	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C715	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C716	1-135-159-21	s TANTALUM, CHIP 10uF 10% 20V
C717	1-135-216-11	s TANTALUM, CHIP 10uF 20% 10V
C718	1-135-216-11	s TANTALUM, CHIP 10uF 20% 10V
CN1	1-566-532-11	s CONNECTOR, FPC 16P
CN2	1-506-478-11	s CONNECTOR, 13P, MALE
CN101	1-506-482-11	s CONNECTOR, 3P, MALE
CN102	1-506-482-11	s CONNECTOR, 3P, MALE
CN103	1-565-212-11	s CONNECTOR, FPC (ZIF) 26P FEMALE
CN104	1-506-482-11	s CONNECTOR, 3P, MALE

## (TC-60P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
CN105	1-506-482-11	s CONNECTOR, 3P, MALE
CN106	1-506-481-11	s CONNECTOR, 2P, MALE
CN107	1-506-481-11	s CONNECTOR, 2P, MALE
CN108	1-506-481-11	s CONNECTOR, 2P, MALE
D1	8-719-902-27	s DIODE EBR3402S
D2	8-719-941-86	s DIODE DAN202U
D3	1-808-016-11	s ARRAY, LED
D4	8-719-110-17	s DIODE RD10ES-B2
D5	8-719-987-74	s DIODE GL3HY43
D6	8-719-987-74	s DIODE GL3HY43
D7	8-719-987-74	s DIODE GL3HY43
D8	8-719-987-74	s DIODE GL3HY43
D101	8-719-800-76	s DIODE 1SS226
D102	8-719-800-76	s DIODE 1SS226
D103	8-719-941-23	s DIODE DA204U
D201	8-719-800-76	s DIODE 1SS226
D202	8-719-800-76	s DIODE 1SS226
D203	8-719-941-23	s DIODE DA204U
D301	8-719-123-85	s DIODE 1SS304
D501	8-719-941-86	s DIODE DAN202U
D502	8-719-938-72	s DIODE SB01-05CP
D503	8-719-941-86	s DIODE DAN202U
D504	8-719-941-86	s DIODE DAN202U
D505	8-719-941-86	s DIODE DAN202U
D506	8-719-941-86	s DIODE DAN202U
D507	8-719-941-86	s DIODE DAN202U
D508	8-719-160-20	s DIODE RD4.7F-B
D509	8-719-800-76	s DIODE 1SS226
D510	8-719-938-72	s DIODE SB01-05CP
D511	8-719-938-72	s DIODE SB01-05CP
D512	8-719-800-76	s DIODE 1SS226
D513	8-719-941-86	s DIODE DAN202U
D514	8-719-105-28	s DIODE RD2.4M-B
D515	8-719-105-28	s DIODE RD2.4M-B
D516	8-719-941-86	s DIODE DAN202U
D517	8-719-941-23	s DIODE DA204U
D518	8-719-941-23	s DIODE DA204U
D701	8-719-123-85	s DIODE 1SS304
D702	8-719-123-85	s DIODE 1SS304
D704	8-719-123-85	s DIODE 1SS304
E1	1-535-877-22	o CHIP, TP
E201	1-535-877-22	o CHIP, TP
E401	1-535-877-22	o CHIP, TP
E501	1-535-877-22	o CHIP, TP
IC1	8-752-832-86	s CXP80P116-845Q
IC2	8-759-942-44	s IC CXD1128Q
IC3	8-759-209-57	s IC TC4S69F
IC4	8-759-701-01	s IC NJM2904M
IC5	8-759-939-41	s IC S-81230AG-RB
IC6	8-752-330-59	s IC CXK1011P
IC7	8-759-209-90	s IC TC4S71F
IC101	8-759-981-54	s IC RC2041MD
IC102	8-759-710-77	s IC NJM4560MD
IC103	8-759-710-77	s IC NJM4560MD
IC104	8-759-981-58	s IC RC2043MD
IC105	8-759-908-16	s IC TL072CPS
IC201	8-759-981-54	s IC RC2041MD
IC202	8-759-710-77	s IC NJM4560MD

## (TC-60P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
IC205	8-759-908-16	s IC TL072CPS
IC301	8-759-300-71	s IC HD14053BFP
IC303	8-759-981-92	s IC RC4558M
IC304	8-759-100-94	s IC UPC358G2
IC500	8-759-112-06	s IC UPC78N05H
IC501	8-759-209-15	s IC TC4SU69F
IC502	8-759-980-28	s IC RH5VA30CA
IC503	8-759-009-12	s IC MC14071BF
IC504	8-759-209-15	s IC TC4SU69F
IC505	8-759-009-10	s IC MC14069UBF
IC506	8-759-209-90	s IC TC4S71F
IC507	8-759-009-12	s IC MC14071BF
IC508	8-759-939-41	s IC S-81230AG-RB
IC509	8-759-008-82	s IC MC14013BF
IC510	8-759-300-71	s IC HD14053BFP
IC511	8-759-009-51	s IC MC14538BF
IC512	8-759-906-53	s IC TL062CPS
IC513	8-759-939-41	s IC S-81230AG-RB
IC514	8-759-008-36	s IC MC74HC4049F
IC515	8-759-146-73	s IC CXD8042Q-502
IC516	8-759-209-97	s IC TC4S81F
IC517	8-759-008-82	s IC MC14013BF
IC518	8-759-209-54	s IC TC4S01F
IC519	8-759-009-02	s IC MC14046BF
IC520	8-759-944-79	s IC CXD1132Q
IC521	8-759-700-45	s IC NJM4556M-A
IC522	8-759-300-71	s IC HD14053BFP
IC523	8-759-111-56	s IC UPC4572G2
IC524	8-759-300-71	s IC HD14053BFP
IC525	8-759-906-53	s IC TL062CPS
IC526	8-759-300-71	s IC HD14053BFP
IC527	8-759-009-22	s IC MC14094BF
IC528	8-759-209-90	s IC TC4S71F
IC529	8-759-209-90	s IC TC4S71F
IC702	8-759-710-77	s IC NJM4560MD
IC703	8-759-700-50	s IC NJM386M
L101	1-410-380-31	s INDUCTOR, CHIP 8.2uH
L102	1-410-380-31	s INDUCTOR, CHIP 8.2uH
L201	1-410-380-31	s INDUCTOR, CHIP 8.2uH
L202	1-410-380-31	s INDUCTOR, CHIP 8.2uH
L701	1-408-797-11	s INDUCTOR, CHIP 470uH
LCD1	1-807-981-21	s DISPLAY PANEL, LIQUID CRYSTAL
Q2	8-729-905-18	s TRANSISTOR DTC144EU
Q3	8-729-230-49	s TRANSISTOR 2SC2712-YG
Q4	8-729-230-49	s TRANSISTOR 2SC2712-YG
Q5	8-729-905-18	s TRANSISTOR DTC144EU
Q6	8-729-117-32	s TRANSISTOR 2SC4177
Q101	8-729-271-31	s TRANSISTOR 2SC2713G
Q102	8-729-117-32	s TRANSISTOR 2SC4177
Q103	8-729-905-18	s TRANSISTOR DTC144EU
Q104	8-729-117-32	s TRANSISTOR 2SC4177
Q105	8-729-117-32	s TRANSISTOR 2SC4177
Q106	8-729-907-00	s TRANSISTOR DTC114EU
Q107	8-729-117-32	s TRANSISTOR 2SC4177
Q201	8-729-271-31	s TRANSISTOR 2SC2713G
Q202	8-729-117-32	s TRANSISTOR 2SC4177
Q203	8-729-905-18	s TRANSISTOR DTC144EU

## (TC-60P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
Q204	8-729-117-32	s TRANSISTOR 2SC4177
Q205	8-729-117-32	s TRANSISTOR 2SC4177
Q206	8-729-907-00	s TRANSISTOR DTC114EU
Q207	8-729-117-32	s TRANSISTOR 2SC4177
Q301	8-729-117-32	s TRANSISTOR 2SC4177
Q401	8-729-117-32	s TRANSISTOR 2SC4177
Q501	8-729-106-68	s TRANSISTOR 2SC1615A-GP
Q502	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q503	8-729-905-18	s TRANSISTOR DTC144EU
Q504	8-729-202-62	s TRANSISTOR 2SD1221
Q505	8-729-120-28	s TRANSISTOR 2SC1623
Q506	8-729-118-70	s TRANSISTOR 2SK739-Z
Q507	8-729-109-41	s TRANSISTOR 2SK94-X1
Q508	8-729-905-18	s TRANSISTOR DTC144EU
Q510	8-729-209-07	s TRANSISTOR 2SC4213-B
Q511	8-729-117-32	s TRANSISTOR 2SC4177
Q512	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q702	8-729-117-32	s TRANSISTOR 2SC4177
Q703	8-729-141-48	s TRANSISTOR 2SB624-BV345
Q704	8-729-141-48	s TRANSISTOR 2SB624-BV345
Q705	8-729-905-18	s TRANSISTOR DTC144EU
Q706	8-729-141-75	s TRANSISTOR 2SD596DV345
R1	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R3	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R4	1-216-815-11	s METAL, CHIP 330 5% 1/16W
R5	1-216-839-11	s METAL, CHIP 33K 5% 1/16W
R6	1-216-806-11	s METAL, CHIP 56 5% 1/16W
R7	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R8	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R9	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R10	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R11	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R12	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R13	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R14	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R15	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R16	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R17	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R18	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R19	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R20	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R21	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R22	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R23	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R24	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R25	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R26	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R27	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R28	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R29	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R30	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R31	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R32	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R33	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R34	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R35	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R36	1-216-849-11	s METAL, CHIP 220K 5% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R37	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R38	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R39	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R40	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R41	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R42	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R43	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R44	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R45	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R46	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R47	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R48	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R49	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R50	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R51	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R52	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R53	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R54	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R55	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R56	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R57	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R58	1-216-840-11	s METAL, CHIP 39K 5% 1/16W
R59	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R60	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R61	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R62	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R63	1-216-844-11	s METAL, CHIP 82K 5% 1/16W
R64	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R65	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R66	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R67	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R68	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R69	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R70	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R71	1-216-846-11	s METAL, CHIP 120K 5% 1/16W
R72	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R73	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R74	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R75	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R76	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R77	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R78	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R79	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R80	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R81	1-218-295-11	s METAL, CHIP 4.3K 5% 1/16W
R82	1-218-272-11	s METAL, CHIP 5.1K 5% 1/16W
R83	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R84	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R85	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R86	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R87	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R88	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R89	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R90	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R91	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R92	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R93	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R94	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R95	1-216-849-11	s METAL, CHIP 220K 5% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R96	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R101	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R102	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R103	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R104	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R105	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R106	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R107	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R108	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R109	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R110	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R111	1-218-740-11	s METAL, CHIP 100K 0.50% 1/16W
R112	1-218-740-11	s METAL, CHIP 100K 0.50% 1/16W
R113	1-218-288-11	s METAL, CHIP 300 5% 1/16W
R114	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R115	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R116	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R117	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R118	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R119	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R120	1-218-705-11	s METAL, CHIP 3.6K 0.50% 1/16W
R121	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R122	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R123	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R124	1-216-801-11	s METAL, CHIP 22 5% 1/16W
R125	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R126	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R127	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R128	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R129	1-218-723-11	s METAL, CHIP 20K 0.50% 1/16W
R130	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R131	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R132	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R133	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R134	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R135	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R137	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R138	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R139	1-218-723-11	s METAL, CHIP 20K 0.50% 1/16W
R140	1-218-736-11	s METAL, CHIP 68K 0.50% 1/16W
R141	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R142	1-218-739-11	s METAL, CHIP 91K 0.5% 1/16W
R143	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R144	1-216-847-11	s METAL, CHIP 150K 5% 1/16W
R145	1-218-705-11	s METAL, CHIP 3.6K 0.50% 1/16W
R146	1-218-705-11	s METAL, CHIP 3.6K 0.50% 1/16W
R147	1-218-672-11	s METAL, CHIP 150 0.50% 1/16W
R148	1-218-672-11	s METAL, CHIP 150 0.50% 1/16W
R149	1-216-810-11	s METAL, CHIP 120 5% 1/16W
R151	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R152	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R153	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R154	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R201	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R202	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R203	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R204	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R205	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R206	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W



## (TC-60P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R207	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R208	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R209	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R210	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R211	1-218-740-11	s METAL, CHIP 100K 0.50% 1/16W
R212	1-218-740-11	s METAL, CHIP 100K 0.50% 1/16W
R213	1-218-288-11	s METAL, CHIP 300 5% 1/16W
R214	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R215	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R216	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R217	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R218	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R219	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R220	1-218-705-11	s METAL, CHIP 3.6K 0.50% 1/16W
R221	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R222	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R223	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R224	1-216-801-11	s METAL, CHIP 22 5% 1/16W
R225	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R226	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R227	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R228	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R229	1-218-723-11	s METAL, CHIP 20K 0.50% 1/16W
R230	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R231	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R232	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R233	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R234	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R235	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R237	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R239	1-218-723-11	s METAL, CHIP 20K 0.50% 1/16W
R240	1-218-736-11	s METAL, CHIP 68K 0.50% 1/16W
R241	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R242	1-218-739-11	s METAL, CHIP 91K 0.5% 1/16W
R243	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R244	1-216-847-11	s METAL, CHIP 150K 5% 1/16W
R245	1-218-705-11	s METAL, CHIP 3.6K 0.50% 1/16W
R246	1-218-705-11	s METAL, CHIP 3.6K 0.50% 1/16W
R247	1-218-672-11	s METAL, CHIP 150 0.50% 1/16W
R248	1-218-672-11	s METAL, CHIP 150 0.50% 1/16W
R249	1-216-810-11	s METAL, CHIP 120 5% 1/16W
R251	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R252	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R253	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R254	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R301	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R302	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R303	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R305	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R306	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R308	1-216-795-11	s METAL, CHIP 6.8K 0.50% 1/16W
R309	1-218-706-11	s METAL, CHIP 3.9K 0.50% 1/16W
R310	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R311	1-218-720-11	s METAL, CHIP 15K 0.50% 1/16W
R312	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R313	1-218-714-11	s METAL, CHIP 8.2K 0.50% 1/16W
R315	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R317	1-218-738-11	s METAL, CHIP 82K 0.5% 1/16W
R318	1-216-857-11	s METAL, CHIP 1M 5% 1/16W

## (TC-60P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R319	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R320	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R401	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R402	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R403	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R405	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R406	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R408	1-216-795-11	s METAL, CHIP 6.8K 0.50% 1/16W
R409	1-218-706-11	s METAL, CHIP 3.9K 0.50% 1/16W
R410	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R411	1-218-720-11	s METAL, CHIP 15K 0.50% 1/16W
R412	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R413	1-218-714-11	s METAL, CHIP 8.2K 0.50% 1/16W
R415	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R417	1-218-738-11	s METAL, CHIP 82K 0.5% 1/16W
R418	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R419	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R420	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R500	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R501	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R502	1-216-805-11	s METAL, CHIP 47 5% 1/16W
R503	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R504	1-216-805-11	s METAL, CHIP 47 5% 1/16W
R505	1-216-805-11	s METAL, CHIP 47 5% 1/16W
R506	1-216-805-11	s METAL, CHIP 47 5% 1/16W
R507	1-216-805-11	s METAL, CHIP 47 5% 1/16W
R508	1-216-805-11	s METAL, CHIP 47 5% 1/16W
R509	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R510	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R511	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R512	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R513	1-216-847-11	s METAL, CHIP 150K 5% 1/16W
R514	1-216-801-11	s METAL, CHIP 22 5% 1/16W
R515	1-216-863-11	s METAL, CHIP 3.3M 5% 1/16W
R516	1-216-863-11	s METAL, CHIP 3.3M 5% 1/16W
R517	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R518	1-216-801-11	s METAL, CHIP 22 5% 1/16W
R519	1-216-801-11	s METAL, CHIP 22 5% 1/16W
R520	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R521	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R522	1-216-851-11	s METAL, CHIP 330K 5% 1/16W
R523	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R524	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R525	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R526	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R527	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R528	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R529	1-216-847-11	s METAL, CHIP 150K 5% 1/16W
R530	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R531	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R532	1-216-851-11	s METAL, CHIP 330K 5% 1/16W
R533	1-216-827-11	s METAL, CHIP 3.3K 5% 1/16W
R534	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R535	1-216-793-11	s METAL, CHIP 4.7 5% 1/16W
R536	1-216-843-11	s METAL, CHIP 68K 5% 1/16W
R537	1-216-843-11	s METAL, CHIP 68K 5% 1/16W
R538	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R539	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R540	1-216-849-11	s METAL, CHIP 220K 5% 1/16W

## (TC-60P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R541	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R550	1-216-801-11	s METAL, CHIP 22 5% 1/16W
R551	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R552	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R554	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R555	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R559	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R560	1-216-851-11	s METAL, CHIP 330K 5% 1/16W
R561	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R562	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R563	1-216-837-11	s METAL, CHIP 22K 5% 1/16W
R564	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R565	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R566	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R567	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R568	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R569	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R570	1-216-861-11	s METAL, CHIP 2.2M 5% 1/16W
R571	1-216-843-11	s METAL, CHIP 68K 5% 1/16W
R573	1-216-847-11	s METAL, CHIP 150K 5% 1/16W
R574	1-216-839-11	s METAL, CHIP 33K 5% 1/16W
R575	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R576	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R577	1-216-843-11	s METAL, CHIP 68K 5% 1/16W
R578	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R579	1-216-863-11	s METAL, CHIP 3.3M 5% 1/16W
R580	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R581	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R582	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R583	1-216-818-11	s METAL, CHIP 560 5% 1/16W
R584	1-216-861-11	s METAL, CHIP 2.2M 5% 1/16W
R585	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R586	1-216-805-11	s METAL, CHIP 47 5% 1/16W
R587	1-216-851-11	s METAL, CHIP 330K 5% 1/16W
R588	1-218-727-11	s METAL, CHIP 30K 0.50% 1/16W
R589	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R590	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R591	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R592	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R593	1-216-865-11	s METAL, CHIP 3K 5% 1/16W
R594	1-216-830-11	s METAL, CHIP 5.6K 5% 1/16W
R595	1-216-850-11	s METAL, CHIP 270K 5% 1/16W
R596	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R597	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R598	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R599	1-216-850-11	s METAL, CHIP 270K 5% 1/16W
R600	1-218-285-11	s METAL, CHIP 75 5% 1/16W
R601	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R602	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R603	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R604	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R605	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R606	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R607	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R608	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R609	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R610	1-216-811-11	s METAL, CHIP 150 5% 1/16W
R611	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R612	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W

## (TC-60P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R613	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R614	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R615	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R616	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R617	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R618	1-216-839-11	s METAL, CHIP 33K 5% 1/16W
R619	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R620	1-216-824-11	s METAL, CHIP 1.8K 5% 1/16W
R621	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R622	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R623	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R624	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R625	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R626	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R630	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R631	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R633	1-216-806-11	s METAL, CHIP 56 5% 1/16W
R634	1-216-813-11	s METAL, CHIP 220 5% 1/16W
R635	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R636	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R637	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R638	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R639	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R640	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R641	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R642	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R643	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R644	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R645	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R646	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R647	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R648	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R649	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R650	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R651	1-218-738-11	s METAL, CHIP 82K 0.5% 1/16W
R700	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R701	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R702	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R703	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R704	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R705	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R706	1-216-847-11	s METAL, CHIP 150K 5% 1/16W
R707	1-216-851-11	s METAL, CHIP 330K 5% 1/16W
R708	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R709	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R710	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R711	1-216-810-11	s METAL, CHIP 120 5% 1/16W
R714	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R715	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R716	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R717	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R718	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R719	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R721	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R726	1-218-344-11	s METAL, CHIP 7.5K 0.50% 1/16W
R728	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R729	1-216-797-11	s METAL, CHIP 10 5% 1/16W
R730	1-216-805-11	s METAL, CHIP 47 5% 1/16W
R737	1-216-812-11	s METAL, CHIP 180 5% 1/16W



## (TC-60P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R738	1-216-812-11	s METAL, CHIP 180 5% 1/16W
R739	1-216-812-11	s METAL, CHIP 180 5% 1/16W
R740	1-216-812-11	s METAL, CHIP 180 5% 1/16W
R741	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R742	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R743	1-218-671-11	s METAL, CHIP 130 0.50% 1/16W
R744	1-216-839-11	s METAL, CHIP 33K 5% 1/16W
R745	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R746	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R747	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
RV01	1-237-038-11	s RES, ADJ, METAL 50K
RV302	1-228-476-00	s RES, ADJ, METAL 50K
RV402	1-228-476-00	s RES, ADJ, METAL 50K
RV700	1-237-035-11	s RES, ADJ, METAL 5K
RV701	1-237-039-11	s RES, ADJ, METAL 100K
RV704	1-228-471-00	s RES, ADJ, METAL 1K
S3	1-570-832-11	s SWITCH, SLIDE
S4	1-570-832-11	s SWITCH, SLIDE
S5	1-554-303-21	s SWITCH, TACTILE
S8	1-554-303-21	s SWITCH, TACTILE
S9	1-554-303-21	s SWITCH, TACTILE
S10	1-554-303-21	s SWITCH, TACTILE
S12	1-570-839-11	s SWITCH, SLIDE
S13	1-554-303-21	s SWITCH, TACTILE
S14	1-554-303-21	s SWITCH, TACTILE
S15	1-570-839-11	s SWITCH, SLIDE
S16	1-571-275-11	s SWITCH, SLIDE
S101	1-571-087-11	s SWITCH, SLIDE
S102	1-570-842-11	s SWITCH, SLIDE
S103	1-571-275-11	s SWITCH, SLIDE
S201	1-571-087-11	s SWITCH, SLIDE
S202	1-570-842-11	s SWITCH, SLIDE
S203	1-571-275-11	s SWITCH, SLIDE
S509	1-554-303-21	s SWITCH, TACTILE
S701	1-570-855-11	s SWITCH, SLIDE
TP1	1-535-877-22	o CHIP, TP
TP2	1-535-877-22	o CHIP, TP
TP3	1-535-877-22	o CHIP, TP
TP4	1-535-877-22	o CHIP, TP
TP5	1-535-877-22	o CHIP, TP
TP6	1-535-877-22	o CHIP, TP
TP7	1-535-877-22	o CHIP, TP
TP8	1-535-877-22	o CHIP, TP
TP9	1-535-877-22	o CHIP, TP
TP10	1-535-877-22	o CHIP, TP
TP11	1-535-877-22	o CHIP, TP
TP12	1-535-877-22	o CHIP, TP
TP13	1-535-877-22	o CHIP, TP
TP14	1-535-877-22	o CHIP, TP
TP15	1-535-877-22	o CHIP, TP
TP16	1-535-877-22	o CHIP, TP
TP101	1-535-877-22	o CHIP, TP
TP201	1-535-877-22	o CHIP, TP
TP301	1-535-877-22	o CHIP, TP
TP401	1-535-877-22	o CHIP, TP
X01	1-567-812-11	s RESONATOR, CERAMIC 12.288MHz
X02	1-578-741-11	s CRYSTAL, 31.25 KHz

## (TC-60P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
X03	1-567-867-11	s CRYSTAL, 14.500MHz
X504	1-577-076-11	s CRYSTAL, 16.000MHz

## VO-34P BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-6727-373-A	o MOUNTED CIRCUIT BOARD, VO-34P
C100	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C101	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C102	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C103	1-162-915-11	s CERAMIC, CHIP 10PF 50V
C104	1-162-921-11	s CERAMIC, CHIP 33PF 5% 50V
C105	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C106	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C107	1-162-921-11	s CERAMIC, CHIP 33PF 5% 50V
C108	1-162-921-11	s CERAMIC, CHIP 33PF 5% 50V
C109	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C110	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C111	1-164-182-11	s CERAMIC CHIP 3300PF 10% 100V
C112	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C114	1-109-540-00	s MICA 180PF 5% 100V
C115	1-162-908-11	s CERAMIC, CHIP 3PF 50V
C116	1-162-922-11	s CERAMIC, CHIP 39PF 5% 50V
C117	1-162-905-11	s CERAMIC, CHIP 1PF 50V
C118	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C119	1-135-167-21	s TANTALUM, CHIP 68uF 10% 6.3V
C120	1-135-157-21	s TANTALUM 10uF 10% 6.3V
C121	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C122	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C123	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C124	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C125	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C126	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C130	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C150	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C151	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C152	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C153	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C154	1-162-905-11	s CERAMIC, CHIP 1PF 50V
C155	1-162-920-11	s CERAMIC, CHIP 27PF 5% 50V
C156	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C157	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C158	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C160	1-162-921-11	s CERAMIC, CHIP 33PF 5% 50V
C161	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C162	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C163	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C200	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C201	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C202	1-162-637-11	s CERAMIC, CHIP 0.47uF 16V
C203	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C204	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C205	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C206	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C207	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C208	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C209	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C210	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C211	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C212	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C213	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C214	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C215	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C216	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V

## (VO-34P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
C217	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C218	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C219	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C220	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C300	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C301	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C302	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C303	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C304	1-162-920-11	s CERAMIC, CHIP 27PF 5% 50V
C305	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C306	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C307	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C350	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C351	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C352	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C353	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C354	1-162-920-11	s CERAMIC, CHIP 27PF 5% 50V
C355	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C356	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C357	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C401	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C402	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C403	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C404	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C405	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C406	1-162-921-11	s CERAMIC, CHIP 33PF 5% 50V
C407	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C408	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C409	1-135-157-21	s TANTALUM 10uF 10% 6.3V
C410	1-162-959-11	s CERAMIC, CHIP 330PF 5% 50V
C411	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C412	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C413	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C414	1-164-315-11	s CERAMIC, CHIP 470PF 10% 50V
C415	1-162-917-11	s CERAMIC, CHIP 15PF 5% 50V
C416	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C417	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C418	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C419	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C420	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C421	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C422	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C450	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C451	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C452	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C453	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C454	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C455	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C456	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C457	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C458	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C459	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C460	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C461	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C462	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C463	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C464	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C465	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C466	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V

## (VO-34P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
C467	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C468	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C469	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C500	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C501	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C502	1-162-911-11	s CERAMIC, CHIP 6PF 50V
C503	1-162-911-11	s CERAMIC, CHIP 6PF 50V
C504	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C505	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C506	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C507	1-164-182-11	s CERAMIC CHIP 330PF 10% 100V
C508	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C509	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C510	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C512	1-109-540-00	s MICA 180PF 5% 100V
C513	1-162-905-11	s CERAMIC, CHIP 1PF 50V
C515	1-135-167-21	s TANTALUM, CHIP 68uF 10% 6.3V
C516	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C517	1-162-925-11	s CERAMIC, CHIP 68PF 5% 50V
C518	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C519	1-162-921-11	s CERAMIC, CHIP 33PF 5% 50V
C520	1-135-157-21	s TANTALUM 10uF 10% 6.3V
C521	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C522	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C523	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C524	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C525	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C526	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C527	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C528	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C529	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C560	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C561	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C562	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C563	1-162-957-11	s CERAMIC, CHIP 220PF 5% 50V
C564	1-164-315-11	s CERAMIC, CHIP 470PF 10% 50V
C565	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C566	1-164-315-11	s CERAMIC, CHIP 470PF 10% 50V
C567	1-164-315-11	s CERAMIC, CHIP 470PF 10% 50V
C568	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C569	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C570	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C571	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C572	1-164-217-11	s CERAMIC, CHIP 150PF 5% 50V
C573	1-164-217-11	s CERAMIC, CHIP 150PF 5% 50V
C600	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C601	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C602	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C603	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C604	1-162-637-11	s CERAMIC, CHIP 0.47uF 16V
C605	1-164-473-11	s CERAMIC, CHIP 820PF 5% 50V
C606	1-164-473-11	s CERAMIC, CHIP 820PF 5% 50V
C607	1-163-037-11	s CERAMIC, CHIP 0.022uF 10% 25V
C608	1-162-637-11	s CERAMIC, CHIP 0.47uF 16V
C609	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C610	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C611	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C612	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C613	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V

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Ref. No. or Q'ty	Part No.	SP Description
C614	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C615	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C616	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C617	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C618	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C619	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C620	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C621	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C622	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C623	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C624	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C627	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C628	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C700	1-162-915-11	s CERAMIC, CHIP 10PF 50V
C701	1-162-915-11	s CERAMIC, CHIP 10PF 50V
C702	1-126-396-11	s ELECT, CHIP 47uF 20% 16V
C703	1-126-396-11	s ELECT, CHIP 47uF 20% 16V
C704	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C705	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C706	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C707	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C708	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C709	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C710	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C711	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C712	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C713	1-164-217-11	s CERAMIC, CHIP 150PF 5% 50V
C714	1-164-217-11	s CERAMIC, CHIP 150PF 5% 50V
C724	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C725	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C726	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C727	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C728	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C750	1-162-915-11	s CERAMIC, CHIP 10PF 50V
C751	1-162-915-11	s CERAMIC, CHIP 10PF 50V
C752	1-126-396-11	s ELECT, CHIP 47uF 20% 16V
C753	1-126-396-11	s ELECT, CHIP 47uF 20% 16V
C754	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C755	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C756	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C757	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C758	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C759	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C760	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C761	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C762	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C763	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C764	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C765	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C800	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C801	1-162-957-11	s CERAMIC, CHIP 220PF 5% 50V
C802	1-162-915-11	s CERAMIC, CHIP 10PF 50V
C803	1-162-923-11	s CERAMIC, CHIP 47PF 5% 50V
C804	1-162-917-11	s CERAMIC, CHIP 15PF 5% 50V
C805	1-162-917-11	s CERAMIC, CHIP 15PF 5% 50V
C806	1-135-161-21	s TANTALUM, CHIP 22uF 10% 10V
C807	1-135-161-21	s TANTALUM, CHIP 22uF 10% 10V
C808	1-135-155-21	s TANTALUM, CHIP 4.7uF 10% 16V
C809	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V

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Ref. No. or Q'ty	Part No.	SP Description
C810	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C811	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C812	1-162-915-11	s CERAMIC, CHIP 10PF 50V
C813	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C814	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C815	1-135-177-21	s TANTALUM, CHIP 1uF 10% 25V
C816	1-162-959-11	s CERAMIC, CHIP 330PF 5% 50V
C817	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C818	1-163-809-11	s CERAMIC, CHIP 0.047uF 10% 25V
C819	1-163-134-00	s CERAMIC 510PF 5% 50V
C820	1-164-217-11	s CERAMIC, CHIP 150PF 5% 50V
C821	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C822	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C823	1-163-275-11	s CERAMIC, CHIP 0.001uF 5% 50V
C824	1-162-927-11	s CERAMIC, CHIP 100PF 5% 50V
C825	1-164-217-11	s CERAMIC, CHIP 150PF 5% 50V
C826	1-162-957-11	s CERAMIC, CHIP 220PF 5% 50V
C827	1-162-920-11	s CERAMIC, CHIP 27PF 5% 50V
C828	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C829	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C830	1-162-917-11	s CERAMIC, CHIP 15PF 5% 50V
C831	1-135-161-21	s TANTALUM, CHIP 22uF 10% 10V
C833	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C834	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C835	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C850	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C851	1-163-275-11	s CERAMIC, CHIP 0.001uF 5% 50V
C852	1-163-275-11	s CERAMIC, CHIP 0.001uF 5% 50V
C853	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C854	1-163-275-11	s CERAMIC, CHIP 0.001uF 5% 50V
C856	1-163-275-11	s CERAMIC, CHIP 0.001uF 5% 50V
C857	1-164-232-11	s CERAMIC 0.01uF 10% 100V
C858	1-162-959-11	s CERAMIC, CHIP 330PF 5% 50V
C859	1-163-275-11	s CERAMIC, CHIP 0.001uF 5% 50V
C860	1-135-161-21	s TANTALUM, CHIP 22uF 10% 10V
C861	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C862	1-164-227-11	s CERAMIC, CHIP 0.022uF 10% 25V
C863	1-164-004-11	s CERAMIC, CHIP 0.1uF 10% 25V
C864	1-126-391-11	s ELECT, CHIP 47uF 20% 6.3V
C900	1-126-396-11	s ELECT, CHIP 47uF 20% 16V
C901	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
C902	1-126-392-11	s ELECT, CHIP 100uF 20% 6.3V
CN1	1-568-091-11	o CONNECTOR, 16P, MALE
CN2	1-568-093-11	s CONNECTOR, 20P, MALE
CN3	1-506-468-11	s CONNECTOR, 3P, MALE
CN4	1-506-468-11	s CONNECTOR, 3P, MALE
CN5	1-506-468-11	s CONNECTOR, 3P, MALE
CN6	1-506-468-11	s CONNECTOR, 3P, MALE
CN7	1-506-468-11	s CONNECTOR, 3P, MALE
CN8	1-506-471-11	s CONNECTOR, 6P, MALE
D400	8-719-821-39	s DIODE 1SV160
D402	8-719-941-23	s DIODE DA204U
D800	8-719-123-85	s DIODE 1SS304
D801	8-719-123-85	s DIODE 1SS304
D850	8-719-123-85	s DIODE 1SS304
D851	8-719-123-85	s DIODE 1SS304
D900	8-719-105-82	s DIODE RD5.1M-B2
D901	8-719-123-82	s DIODE 1SS303

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Ref. No. or Q'ty	Part No.	SP Description
D902	8-719-123-85	s DIODE 1SS304
E100	1-535-877-22	o CHIP, TP
E200	1-535-877-22	o CHIP, TP
E300	1-535-877-22	o CHIP, TP
E400	1-535-877-22	o CHIP, TP
E450	1-535-877-22	o CHIP, TP
E500	1-535-877-22	o CHIP, TP
E600	1-535-877-22	o CHIP, TP
FL100	1-236-019-21	s FILTER, LOW PASS (CHIP)
FL300	1-239-313-11	s FILTER, LOW PASS
FL350	1-239-313-11	s FILTER, LOW PASS
FL500	1-239-314-11	s FILTER, LOW PASS
FL501	1-236-021-21	s FILTER, LOW PASS (CHIP)
IC100	8-752-036-77	s IC CXA1179N
IC150	8-752-052-76	s IC CXA1480Q
IC400	8-752-344-95	s IC CXD2215Q
IC401	8-759-239-58	s IC TC74HC221AF
IC402	8-759-008-67	s IC MC14066BF
IC403	8-759-030-16	s IC MC34182M
IC404	8-759-100-94	s IC UPC358G2
IC405	8-759-243-19	s IC TC7SU04F
IC406	8-759-243-19	s IC TC7SU04F
IC407	8-759-239-58	s IC TC74HC221AF
IC408	8-759-239-58	s IC TC74HC221AF
IC409	8-759-243-19	s IC TC7SU04F
IC410	8-759-209-97	s IC TC4S81F
IC450	8-752-334-55	s IC CXD1175M
IC451	8-752-334-55	s IC CXD1175M
IC452	8-752-329-28	s IC CXD1151Q
IC453	8-752-352-34	s IC CXD1171M-1
IC500	8-752-063-07	s IC CXA1179N
IC560	8-759-209-15	s IC TC4SU69F
IC561	8-759-209-15	s IC TC4SU69F
IC700	1-809-458-11	s HIC (PRE-AMP)
IC701	1-809-458-11	s HIC (PRE-AMP)
IC702	8-759-230-99	s IC TC74HC4053AF
IC750	1-809-458-11	s HIC (PRE-AMP)
IC751	1-809-458-11	s HIC (PRE-AMP)
IC752	8-759-230-99	s IC TC74HC4053AF
IC800	8-759-230-99	s IC TC74HC4053AF
IC801	8-752-002-99	s IC CX20030
IC802	8-759-009-51	s IC MC14538BF
IC850	8-752-052-73	s IC CXA1451M
IC900	8-759-209-15	s IC TC4SU69F
IC901	8-759-300-71	s IC HD14053BFP
IC902	8-759-209-90	s IC TC4S71F
IC903	8-759-209-90	s IC TC4S71F
IC904	8-759-300-71	s IC HD14053BFP
L100	1-408-789-21	s INDUCTOR, CHIP 100UH
L101	1-408-789-21	s INDUCTOR, CHIP 100UH
L102	1-408-793-21	s INDUCTOR, CHIP 220UH
L103	1-408-779-31	s INDUCTOR, CHIP 15uH
L104	1-408-789-21	s INDUCTOR, CHIP 100UH
L150	1-408-785-21	s INDUCTOR, CHIP 47UH
L200	1-408-789-21	s INDUCTOR, CHIP 100UH
L201	1-408-789-21	s INDUCTOR, CHIP 100UH
L202	1-408-785-21	s INDUCTOR, CHIP 47UH
L203	1-408-785-21	s INDUCTOR, CHIP 47UH

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Ref. No. or Q'ty	Part No.	SP Description
L204	1-408-785-21	s INDUCTOR, CHIP 47UH
L205	1-408-785-21	s INDUCTOR, CHIP 47UH
L300	1-408-789-21	s INDUCTOR, CHIP 100UH
L301	1-408-789-21	s INDUCTOR, CHIP 100UH
L302	1-408-773-31	s INDUCTOR, CHIP 4.7uH
L350	1-408-789-21	s INDUCTOR, CHIP 100UH
L351	1-408-789-21	s INDUCTOR, CHIP 100UH
L352	1-408-773-31	s INDUCTOR, CHIP 4.7uH
L400	1-408-789-21	s INDUCTOR, CHIP 100UH
L401	1-408-789-21	s INDUCTOR, CHIP 100UH
L450	1-408-789-21	s INDUCTOR, CHIP 100UH
L451	1-408-789-21	s INDUCTOR, CHIP 100UH
L500	1-408-789-21	s INDUCTOR, CHIP 100UH
L501	1-408-789-21	s INDUCTOR, CHIP 100UH
L502	1-408-785-21	s INDUCTOR, CHIP 47UH
L503	1-408-789-21	s INDUCTOR, CHIP 100UH
L560	1-408-789-21	s INDUCTOR, CHIP 100UH
L561	1-408-789-21	s INDUCTOR, CHIP 100UH
L562	1-408-797-11	s INDUCTOR, CHIP 470UH
L563	1-408-797-11	s INDUCTOR, CHIP 470UH
L600	1-408-789-21	s INDUCTOR, CHIP 100UH
L601	1-408-789-21	s INDUCTOR, CHIP 100UH
L602	1-408-793-21	s INDUCTOR, CHIP 220UH
L603	1-408-785-21	s INDUCTOR, CHIP 47UH
L604	1-408-785-21	s INDUCTOR, CHIP 47UH
L605	1-408-785-21	s INDUCTOR, CHIP 47UH
L606	1-408-785-21	s INDUCTOR, CHIP 47UH
L700	1-408-789-21	s INDUCTOR, CHIP 100UH
L701	1-408-789-21	s INDUCTOR, CHIP 100UH
L750	1-408-789-21	s INDUCTOR, CHIP 100UH
L751	1-408-789-21	s INDUCTOR, CHIP 100UH
L800	1-408-789-21	s INDUCTOR, CHIP 100UH
L801	1-408-789-21	s INDUCTOR, CHIP 100UH
L802	1-408-781-00	s INDUCTOR, CHIP 22UH
L803	1-408-794-00	s INDUCTOR, CHIP 270UH
L850	1-408-789-21	s INDUCTOR, CHIP 100UH
L851	1-408-778-21	s INDUCTOR, CHIP 12uH
L900	1-408-789-21	s INDUCTOR, CHIP 100UH
L901	1-412-533-11	s INDUCTOR 47uH
L902	1-412-533-11	s INDUCTOR 47uH
LV400	1-412-018-11	s COIL, VAR 5.6uH
Q100	8-729-117-32	s TRANSISTOR 2SC4177
Q101	8-729-117-32	s TRANSISTOR 2SC4177
Q102	8-729-117-32	s TRANSISTOR 2SC4177
Q103	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q104	8-729-117-32	s TRANSISTOR 2SC4177
Q105	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q106	8-729-905-18	s TRANSISTOR DTC144EU
Q107	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q150	8-729-117-32	s TRANSISTOR 2SC4177
Q151	8-729-117-32	s TRANSISTOR 2SC4177
Q152	8-729-117-32	s TRANSISTOR 2SC4177
Q153	8-729-117-32	s TRANSISTOR 2SC4177
Q154	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q155	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q200	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q201	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q202	8-729-117-73	s TRANSISTOR 2SC4178-F14

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Ref. No. or Q'ty	Part No.	SP Description
Q203	8-729-209-07	s TRANSISTOR 2SC4213-B
Q204	8-729-209-07	s TRANSISTOR 2SC4213-B
Q205	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q206	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q207	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q208	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q209	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q210	8-729-117-32	s TRANSISTOR 2SC4177
Q211	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q212	8-729-117-32	s TRANSISTOR 2SC4177
Q213	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q214	8-729-209-07	s TRANSISTOR 2SC4213-B
Q215	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q216	8-729-209-07	s TRANSISTOR 2SC4213-B
Q217	8-729-112-65	s TRANSISTOR 2SA1462-Y33
Q218	8-729-140-47	s TRANSISTOR 2SC3735-B34
Q219	8-729-112-65	s TRANSISTOR 2SA1462-Y33
Q220	8-729-140-47	s TRANSISTOR 2SC3735-B34
Q221	8-729-209-07	s TRANSISTOR 2SC4213-B
Q222	8-729-209-07	s TRANSISTOR 2SC4213-B
Q223	8-729-209-07	s TRANSISTOR 2SC4213-B
Q224	8-729-209-07	s TRANSISTOR 2SC4213-B
Q225	8-729-209-07	s TRANSISTOR 2SC4213-B
Q226	8-729-209-07	s TRANSISTOR 2SC4213-B
Q300	8-729-117-32	s TRANSISTOR 2SC4177
Q301	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q302	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q303	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q304	8-729-117-32	s TRANSISTOR 2SC4177
Q305	8-729-422-44	s TRANSISTOR 2SK663
Q306	8-729-117-32	s TRANSISTOR 2SC4177
Q307	8-729-117-32	s TRANSISTOR 2SC4177
Q350	8-729-117-32	s TRANSISTOR 2SC4177
Q351	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q352	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q353	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q354	8-729-117-32	s TRANSISTOR 2SC4177
Q355	8-729-422-44	s TRANSISTOR 2SK663
Q356	8-729-117-32	s TRANSISTOR 2SC4177
Q357	8-729-117-32	s TRANSISTOR 2SC4177
Q400	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q401	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q500	8-729-117-32	s TRANSISTOR 2SC4177
Q501	8-729-117-32	s TRANSISTOR 2SC4177
Q502	8-729-117-32	s TRANSISTOR 2SC4177
Q503	8-729-117-32	s TRANSISTOR 2SC4177
Q504	8-729-117-32	s TRANSISTOR 2SC4177
Q505	8-729-117-32	s TRANSISTOR 2SC4177
Q506	8-729-905-18	s TRANSISTOR DTC144EU
Q507	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q508	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q509	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q510	8-729-117-73	s TRANSISTOR 2SC4178-F14
Q511	8-729-117-16	s TRANSISTOR 2SA1611-M6
Q560	8-729-117-32	s TRANSISTOR 2SC4177
Q561	8-729-117-32	s TRANSISTOR 2SC4177
Q562	8-729-117-32	s TRANSISTOR 2SC4177
Q563	8-729-117-32	s TRANSISTOR 2SC4177
Q600	8-729-117-73	s TRANSISTOR 2SC4178-F14

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Ref. No. or Q'ty	Part No.	SP Description
Q601	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q602	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q603	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q604	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q605	8-729-209-07 s	TRANSISTOR 2SC4213-B
Q606	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q607	8-729-209-07 s	TRANSISTOR 2SC4213-B
Q608	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q609	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q610	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q611	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q612	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q613	8-729-117-16 s	TRANSISTOR 2SA1611-M6
Q614	8-729-117-32 s	TRANSISTOR 2SC4177
Q615	8-729-117-16 s	TRANSISTOR 2SA1611-M6
Q616	8-729-117-32 s	TRANSISTOR 2SC4177
Q617	8-729-117-16 s	TRANSISTOR 2SA1611-M6
Q618	8-729-209-07 s	TRANSISTOR 2SC4213-B
Q619	8-729-117-16 s	TRANSISTOR 2SA1611-M6
Q620	8-729-209-07 s	TRANSISTOR 2SC4213-B
Q621	8-729-112-65 s	TRANSISTOR 2SA1462-Y33
Q622	8-729-140-47 s	TRANSISTOR 2SC3735-B34
Q623	8-729-112-65 s	TRANSISTOR 2SA1462-Y33
Q624	8-729-140-47 s	TRANSISTOR 2SC3735-B34
Q625	8-729-209-07 s	TRANSISTOR 2SC4213-B
Q626	8-729-209-07 s	TRANSISTOR 2SC4213-B
Q627	8-729-209-07 s	TRANSISTOR 2SC4213-B
Q628	8-729-209-07 s	TRANSISTOR 2SC4213-B
Q629	8-729-209-07 s	TRANSISTOR 2SC4213-B
Q630	8-729-209-07 s	TRANSISTOR 2SC4213-B
Q700	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q701	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q702	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q703	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q704	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q705	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q706	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q707	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q750	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q751	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q752	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q753	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q754	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q755	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q756	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q757	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q800	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q801	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q802	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q803	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q804	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q805	8-729-905-12 s	TRANSISTOR DTA144EU
Q806	8-729-905-18 s	TRANSISTOR DTC144EU
Q807	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q808	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q809	8-729-905-18 s	TRANSISTOR DTC144EU
Q810	8-729-905-12 s	TRANSISTOR DTA144EU
Q811	8-729-906-33 s	TRANSISTOR DTC114YU
Q812	8-729-905-18 s	TRANSISTOR DTC144EU

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Ref. No. or Q'ty	Part No.	SP Description
Q813	8-729-905-12 s	TRANSISTOR DTA144EU
Q850	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q851	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q852	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q853	8-729-117-73 s	TRANSISTOR 2SC4178-F14
Q900	8-729-117-16 s	TRANSISTOR 2SA1611-M6
Q901	8-729-117-16 s	TRANSISTOR 2SA1611-M6
Q902	8-729-807-50 s	TRANSISTOR 2SD1623
Q903	8-729-807-50 s	TRANSISTOR 2SD1623
Q904	8-729-106-60 s	TRANSISTOR 2SB1115A
Q905	8-729-106-60 s	TRANSISTOR 2SB1115A
Q906	8-729-106-60 s	TRANSISTOR 2SB1115A
R100	1-218-720-11 s	METAL, CHIP 15K 0.50% 1/16W
R101	1-218-704-11 s	METAL, CHIP 3.3K 0.50% 1/16W
R102	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R103	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R104	1-218-708-11 s	METAL, CHIP 4.7K 0.50% 1/16W
R105	1-216-817-11 s	METAL, CHIP 470 5% 1/16W
R106	1-216-822-11 s	METAL, CHIP 1.2K 5% 1/16W
R107	1-218-313-11 s	METAL, CHIP 560 1% 1/16W
R108	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R109	1-218-698-11 s	METAL, CHIP 1.8K 0.50% 1/16W
R110	1-218-716-11 s	METAL, CHIP 10K 0.50% 1/16W
R111	1-218-290-11 s	METAL, CHIP 6.2K 5% 1/16W
R112	1-218-272-11 s	METAL, CHIP 5.1K 5% 1/16W
R113	1-218-716-11 s	METAL, CHIP 10K 0.50% 1/16W
R114	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R115	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R116	1-216-822-11 s	METAL, CHIP 1.2K 5% 1/16W
R117	1-216-840-11 s	METAL, CHIP 39K 5% 1/16W
R118	1-218-704-11 s	METAL, CHIP 3.3K 0.50% 1/16W
R119	1-218-716-11 s	METAL, CHIP 10K 0.50% 1/16W
R120	1-216-857-11 s	METAL, CHIP 1M 5% 1/16W
R121	1-216-821-11 s	METAL, CHIP 1K 5% 1/16W
R122	1-218-720-11 s	METAL, CHIP 15K 0.50% 1/16W
R123	1-218-716-11 s	METAL, CHIP 10K 0.50% 1/16W
R124	1-218-184-11 s	METAL, CHIP 997 0.1% 1/16W
R126	1-218-922-11 s	METAL, CHIP 3.26K 0.10% 1/16W
R127	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R128	1-218-668-11 s	METAL, CHIP 100 0.50% 1/16W
R129	1-218-289-11 s	METAL, CHIP 510 5% 1/16W
R130	1-218-668-11 s	METAL, CHIP 100 0.50% 1/16W
R131	1-218-295-11 s	METAL, CHIP 4.3K 5% 1/16W
R132	1-218-720-11 s	METAL, CHIP 15K 0.50% 1/16W
R133	1-218-271-11 s	METAL, CHIP 2K 0.50% 1/16W
R134	1-218-271-11 s	METAL, CHIP 2K 0.50% 1/16W
R135	1-216-865-11 s	METAL, CHIP 3K 5% 1/16W
R136	1-218-271-11 s	METAL, CHIP 2K 0.50% 1/16W
R137	1-216-826-11 s	METAL, CHIP 2.7K 5% 1/16W
R138	1-216-825-11 s	METAL, CHIP 2.2K 5% 1/16W
R139	1-216-823-11 s	METAL, CHIP 1.5K 5% 1/16W
R141	1-218-706-11 s	METAL, CHIP 3.9K 0.50% 1/16W
R142	1-218-724-11 s	METAL, CHIP 22K 0.50% 1/16W
R143	1-218-723-11 s	METAL, CHIP 20K 0.50% 1/16W
R144	1-218-735-11 s	METAL, CHIP 62K 0.50% 1/16W
R145	1-218-716-11 s	METAL, CHIP 10K 0.50% 1/16W
R146	1-218-296-11 s	METAL, CHIP 75K 5% 1/16W
R147	1-216-834-11 s	METAL, CHIP 12K 5% 1/16W



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Ref. No. or Q'ty	Part No.	SP Description
R148	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R149	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R150	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R151	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R152	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R153	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R154	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R155	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R156	1-216-865-11	s METAL, CHIP 3K 5% 1/16W
R157	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R158	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R159	1-218-676-11	s METAL, CHIP 220 0.50% 1/16W
R160	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R161	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R162	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R164	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R165	1-216-865-11	s METAL, CHIP 3K 5% 1/16W
R166	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R167	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R168	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R169	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R170	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R171	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R172	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R173	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R174	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R175	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R176	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R177	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R178	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R179	1-218-720-11	s METAL, CHIP 15K 0.50% 1/16W
R181	1-216-836-11	s METAL, CHIP 18K 5% 1/16W
R183	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R184	1-218-723-11	s METAL, CHIP 20K 0.50% 1/16W
R200	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R201	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R202	1-218-676-11	s METAL, CHIP 220 0.50% 1/16W
R203	1-218-676-11	s METAL, CHIP 220 0.50% 1/16W
R204	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R205	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R206	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R207	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R208	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R209	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R210	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R211	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R212	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R213	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R214	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R215	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R216	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R217	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R218	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R219	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R220	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R221	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R222	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R223	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R224	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R225	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R226	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R227	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R228	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R229	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R230	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R231	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R232	1-216-308-00	s METAL, CHIP 4.7 5% 1/10W
R233	1-216-613-11	s METAL, CHIP 27 0.5% 1/10W
R234	1-216-308-00	s METAL, CHIP 4.7 5% 1/10W
R235	1-216-613-11	s METAL, CHIP 27 0.5% 1/10W
R236	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R237	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R238	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R239	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R242	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R243	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R244	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R245	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R246	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R247	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R250	1-216-801-11	s METAL, CHIP 22 5% 1/16W
R251	1-216-801-11	s METAL, CHIP 22 5% 1/16W
R300	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R301	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R302	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R303	1-218-695-11	s METAL, CHIP 1.3K 0.50% 1/16W
R304	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R305	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R306	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R307	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R308	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R309	1-216-815-11	s METAL, CHIP 330 5% 1/16W
R310	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R311	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R312	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R314	1-218-883-11	s METAL, CHIP 33K 0.50% 1/16W
R315	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R316	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R317	1-218-313-11	s METAL, CHIP 560 1% 1/16W
R350	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R351	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R352	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R353	1-218-695-11	s METAL, CHIP 1.3K 0.50% 1/16W
R354	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R355	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R356	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R357	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R358	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R359	1-216-815-11	s METAL, CHIP 330 5% 1/16W
R360	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R361	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R362	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R364	1-218-883-11	s METAL, CHIP 33K 0.50% 1/16W
R365	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R366	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R367	1-218-313-11	s METAL, CHIP 560 1% 1/16W
R370	1-249-421-11	s CARBON 2.2K 5% 1/4W
R371	1-249-421-11	s CARBON 2.2K 5% 1/4W

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Ref. No. or Q'ty	Part No.	SP Description
R400	1-218-740-11	s METAL, CHIP 100K 0.50% 1/16W
R401	1-218-732-11	s METAL, CHIP 47K 0.50% 1/16W
R402	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R403	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R404	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R406	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R407	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R408	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R409	1-218-706-11	s METAL, CHIP 3.9K 0.50% 1/16W
R410	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R411	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R412	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R413	1-216-994-11	s METAL, CHIP 13K 0.50% 1/16W
R414	1-218-732-11	s METAL, CHIP 47K 0.50% 1/16W
R415	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R416	1-218-700-11	s METAL, CHIP 2.2K 0.50% 1/16W
R418	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R419	1-218-676-11	s METAL, CHIP 220 0.50% 1/16W
R420	1-218-733-11	s METAL, CHIP 51K 0.50% 1/16W
R421	1-218-736-11	s METAL, CHIP 68K 0.50% 1/16W
R422	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R423	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R424	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R425	1-218-706-11	s METAL, CHIP 3.9K 0.50% 1/16W
R450	1-218-732-11	s METAL, CHIP 47K 0.50% 1/16W
R451	1-218-732-11	s METAL, CHIP 47K 0.50% 1/16W
R452	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R453	1-218-883-11	s METAL, CHIP 33K 0.50% 1/16W
R454	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R455	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R500	1-218-676-11	s METAL, CHIP 220 0.50% 1/16W
R501	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R502	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R503	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R504	1-218-295-11	s METAL, CHIP 4.3K 5% 1/16W
R505	1-216-822-11	s METAL, CHIP 1.2K 5% 1/16W
R506	1-216-840-11	s METAL, CHIP 39K 5% 1/16W
R507	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R508	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R509	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R510	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R511	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R512	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R513	1-216-865-11	s METAL, CHIP 3K 5% 1/16W
R514	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R515	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R516	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R517	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R519	1-216-865-11	s METAL, CHIP 3K 5% 1/16W
R520	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R521	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R522	1-218-184-11	s METAL, CHIP 997 0.1% 1/16W
R523	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R525	1-218-922-11	s METAL, CHIP 3.26K 0.10% 1/16W
R526	1-218-271-11	s METAL, CHIP 2K 0.50% 1/16W
R527	1-218-677-11	s METAL, CHIP 240 0.50% 1/16W
R528	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R529	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R530	1-216-836-11	s METAL, CHIP 18K 5% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R531	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R532	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R533	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R534	1-218-720-11	s METAL, CHIP 15K 0.50% 1/16W
R535	1-216-840-11	s METAL, CHIP 39K 5% 1/16W
R536	1-218-700-11	s METAL, CHIP 2.2K 0.50% 1/16W
R538	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R539	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R540	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R541	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R542	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R543	1-218-272-11	s METAL, CHIP 5.1K 5% 1/16W
R544	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R545	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R546	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R547	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R548	1-218-735-11	s METAL, CHIP 62K 0.50% 1/16W
R549	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R550	1-218-296-11	s METAL, CHIP 75K 5% 1/16W
R551	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
R552	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R553	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R554	1-218-727-11	s METAL, CHIP 30K 0.50% 1/16W
R555	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R556	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R557	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R558	1-218-883-11	s METAL, CHIP 33K 0.50% 1/16W
R559	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R560	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R561	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R562	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R563	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R564	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R565	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R566	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R567	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R568	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R569	1-216-822-11	s METAL, CHIP 1.2K 5% 1/16W
R570	1-216-822-11	s METAL, CHIP 1.2K 5% 1/16W
R571	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R572	1-218-738-11	s METAL, CHIP 82K 0.5% 1/16W
R573	1-218-733-11	s METAL, CHIP 51K 0.50% 1/16W
R574	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R600	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R601	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R602	1-218-289-11	s METAL, CHIP 510 5% 1/16W
R603	1-218-289-11	s METAL, CHIP 510 5% 1/16W
R604	1-220-373-11	s METAL, CHIP 62K 0.50% 1/16W
R605	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R606	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R607	1-218-288-11	s METAL, CHIP 300 5% 1/16W
R608	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R609	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R610	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R611	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R612	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R613	1-218-676-11	s METAL, CHIP 220 0.50% 1/16W
R614	1-218-676-11	s METAL, CHIP 220 0.50% 1/16W
R615	1-216-821-11	s METAL, CHIP 1K 5% 1/16W



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Ref. No. or Q'ty	Part No.	SP Description
R616	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R617	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R618	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R619	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R620	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R621	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R622	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R623	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R624	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R625	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R626	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R627	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R628	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R629	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R630	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R631	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R632	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R633	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R634	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R635	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R636	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R637	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R638	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R639	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R640	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R641	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R642	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R643	1-216-308-00	s METAL, CHIP 4.7 5% 1/10W
R644	1-216-613-11	s METAL, CHIP 27 0.5% 1/10W
R645	1-216-308-00	s METAL, CHIP 4.7 5% 1/10W
R646	1-216-613-11	s METAL, CHIP 27 0.5% 1/10W
R647	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R648	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R649	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R650	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R653	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R654	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R655	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R656	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R657	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R658	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R660	1-216-801-11	s METAL, CHIP 22 5% 1/16W
R661	1-216-801-11	s METAL, CHIP 22 5% 1/16W
R700	1-218-723-11	s METAL, CHIP 20K 0.50% 1/16W
R701	1-218-723-11	s METAL, CHIP 20K 0.50% 1/16W
R702	1-216-603-11	s METAL, CHIP 10 0.5% 1/10W
R703	1-216-603-11	s METAL, CHIP 10 0.5% 1/10W
R704	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R705	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R706	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R707	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R708	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R709	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R710	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R711	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R712	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R713	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R714	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R715	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R716	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R717	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R718	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R719	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R720	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R721	1-216-811-11	s METAL, CHIP 150 5% 1/16W
R722	1-218-676-11	s METAL, CHIP 220 0.50% 1/16W
R723	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R724	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R725	1-216-807-11	s METAL, CHIP 68 5% 1/16W
R750	1-218-723-11	s METAL, CHIP 20K 0.50% 1/16W
R751	1-218-723-11	s METAL, CHIP 20K 0.50% 1/16W
R752	1-216-603-11	s METAL, CHIP 10 0.5% 1/10W
R753	1-216-603-11	s METAL, CHIP 10 0.5% 1/10W
R754	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R755	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R756	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R757	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R758	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R759	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R760	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R761	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R762	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R763	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R764	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R765	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R766	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R767	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R768	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R769	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R770	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R771	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R772	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R773	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R774	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R775	1-216-807-11	s METAL, CHIP 68 5% 1/16W
R800	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R801	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R802	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R803	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R804	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R805	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R806	1-218-706-11	s METAL, CHIP 3.9K 0.50% 1/16W
R807	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R808	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R809	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R810	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R811	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R812	1-218-706-11	s METAL, CHIP 3.9K 0.50% 1/16W
R813	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R814	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R815	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R816	1-216-847-11	s METAL, CHIP 150K 5% 1/16W
R817	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R818	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R819	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R820	1-218-698-11	s METAL, CHIP 1.8K 0.50% 1/16W
R821	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R822	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W

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Ref. No. or Q'ty	Part No.	SP Description
R823	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R824	1-218-676-11	s METAL, CHIP 220 0.50% 1/16W
R825	1-216-817-11	s METAL, CHIP 470 5% 1/16W
R826	1-216-819-11	s METAL, CHIP 680 5% 1/16W
R827	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R828	1-218-883-11	s METAL, CHIP 33K 0.50% 1/16W
R829	1-218-332-11	s METAL, CHIP 130K 0.50% 1/16W
R830	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R831	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R832	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R833	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R834	1-218-732-11	s METAL, CHIP 47K 0.50% 1/16W
R835	1-216-853-11	s METAL, CHIP 470K 5% 1/16W
R836	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R837	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R838	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R839	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R840	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R841	1-216-849-11	s METAL, CHIP 220K 5% 1/16W
R842	1-216-807-11	s METAL, CHIP 68 5% 1/16W
R850	1-216-815-11	s METAL, CHIP 330 5% 1/16W
R851	1-218-704-11	s METAL, CHIP 3.3K 0.50% 1/16W
R852	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R853	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R855	1-216-820-11	s METAL, CHIP 820 5% 1/16W
R856	1-218-716-11	s METAL, CHIP 10K 0.50% 1/16W
R857	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R858	1-216-819-11	s METAL, CHIP 680 5% 1/16W
R859	1-218-668-11	s METAL, CHIP 100 0.50% 1/16W
R860	1-216-831-11	s METAL, CHIP 6.8K 5% 1/16W
R861	1-218-732-11	s METAL, CHIP 47K 0.50% 1/16W
R862	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R863	1-218-708-11	s METAL, CHIP 4.7K 0.50% 1/16W
R864	1-218-724-11	s METAL, CHIP 22K 0.50% 1/16W
R865	1-216-823-11	s METAL, CHIP 1.5K 5% 1/16W
R866	1-218-285-11	s METAL, CHIP 75 5% 1/16W
R867	1-218-285-11	s METAL, CHIP 75 5% 1/16W
R900	1-218-740-11	s METAL, CHIP 100K 0.50% 1/16W
R901	1-218-740-11	s METAL, CHIP 100K 0.50% 1/16W
R902	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R903	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R904	1-218-732-11	s METAL, CHIP 47K 0.50% 1/16W
R905	1-218-732-11	s METAL, CHIP 47K 0.50% 1/16W
R906	1-218-732-11	s METAL, CHIP 47K 0.50% 1/16W
R907	1-218-732-11	s METAL, CHIP 47K 0.50% 1/16W
R908	1-216-819-11	s METAL, CHIP 680 5% 1/16W
R909	1-216-819-11	s METAL, CHIP 680 5% 1/16W
R910	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R911	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R912	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R913	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R914	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R915	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
RV100	1-237-032-11	s RES, ADJ, METAL 500
RV101	1-237-034-11	s RES, ADJ, METAL 2K
RV102	1-237-035-11	s RES, ADJ, METAL 5K
RV103	1-237-034-11	s RES, ADJ, METAL 2K
RV104	1-237-035-11	s RES, ADJ, METAL 5K

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Ref. No. or Q'ty	Part No.	SP Description
RV105	1-237-037-11	s RES, ADJ, METAL 20K
RV106	1-237-034-11	s RES, ADJ, METAL 2K
RV107	1-237-034-11	s RES, ADJ, METAL 2K
RV108	1-237-036-11	s RES, ADJ, METAL 10K
RV200	1-237-035-11	s RES, ADJ, METAL 5K
RV201	1-237-030-11	s RES, ADJ, METAL 100
RV202	1-237-033-11	s RES, ADJ, METAL 1K
RV250	1-237-035-11	s RES, ADJ, METAL 5K
RV251	1-237-030-11	s RES, ADJ, METAL 100
RV252	1-237-033-11	s RES, ADJ, METAL 1K
RV300	1-237-033-11	s RES, ADJ, METAL 1K
RV301	1-237-033-11	s RES, ADJ, METAL 1K
RV302	1-237-036-11	s RES, ADJ, METAL 10K
RV351	1-237-033-11	s RES, ADJ, METAL 1K
RV352	1-237-036-11	s RES, ADJ, METAL 10K
RV400	1-237-037-11	s RES, ADJ, METAL 20K
RV401	1-237-037-11	s RES, ADJ, METAL 20K
RV450	1-237-037-11	s RES, ADJ, METAL 20K
RV451	1-237-037-11	s RES, ADJ, METAL 20K
RV500	1-237-034-11	s RES, ADJ, METAL 2K
RV501	1-237-034-11	s RES, ADJ, METAL 2K
RV502	1-237-035-11	s RES, ADJ, METAL 5K
RV503	1-237-036-11	s RES, ADJ, METAL 10K
RV504	1-237-036-11	s RES, ADJ, METAL 10K
RV505	1-237-037-11	s RES, ADJ, METAL 20K
RV506	1-237-034-11	s RES, ADJ, METAL 2K
RV507	1-237-034-11	s RES, ADJ, METAL 2K
RV508	1-237-036-11	s RES, ADJ, METAL 10K
RV600	1-237-035-11	s RES, ADJ, METAL 5K
RV601	1-237-030-11	s RES, ADJ, METAL 100
RV602	1-237-032-11	s RES, ADJ, METAL 500
RV650	1-237-035-11	s RES, ADJ, METAL 5K
RV651	1-237-030-11	s RES, ADJ, METAL 100
RV652	1-237-032-11	s RES, ADJ, METAL 500
RV700	1-237-033-11	s RES, ADJ, METAL 1K
RV701	1-237-033-11	s RES, ADJ, METAL 1K
RV750	1-237-033-11	s RES, ADJ, METAL 1K
RV751	1-237-033-11	s RES, ADJ, METAL 1K
RV800	1-237-036-11	s RES, ADJ, METAL 10K
RV850	1-237-030-11	s RES, ADJ, METAL 100
SP200	1-566-388-11	s CONNECTOR, 8P, MALE
SP201	1-566-388-11	s CONNECTOR, 8P, MALE
SP202	1-566-388-11	s CONNECTOR, 8P, MALE
SP600	1-566-388-11	s CONNECTOR, 8P, MALE
SP601	1-566-388-11	s CONNECTOR, 8P, MALE
SP602	1-566-388-11	s CONNECTOR, 8P, MALE
SS200	1-565-413-11	o PLUG, SHORTING
SS201	1-565-413-11	o PLUG, SHORTING
SS202	1-565-413-11	o PLUG, SHORTING
SS600	1-565-413-11	o PLUG, SHORTING
SS601	1-565-413-11	o PLUG, SHORTING
SS602	1-565-413-11	o PLUG, SHORTING
T200	1-427-595-11	s TRANSFORMER, RF INPUT
T201	1-427-595-11	s TRANSFORMER, RF INPUT
T600	1-423-254-11	s TRANSFORMER, RF INPUT
T601	1-423-254-11	s TRANSFORMER, RF INPUT
TH400	1-809-308-21	s THERMISTOR, CHIP 3.3K

(V0-34P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
TR2	8-769-401-59	s TRANSISTOR 2SK613-3
TR3	8-769-401-59	s TRANSISTOR 2SK613-3
X400	1-567-864-11	s CRYSTAL, 10.737635MHz
X560	1-579-412-11	s RESONATOR, CERAMIC 310KHz
X561	1-579-413-11	s RESONATOR, CERAMIC 540KHz

(V0-34P BOARD)

Ref. No. or Q'ty	Part No.	SP Description
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FRAME

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-6050-833-A	s DRUM ASSY, DBM-23A-R
1pc	1-466-600-11	s CONVERTER DC-DC
1pc	1-543-316-21	s HEAD, SENSING(SMALL TYPE)"TAPE TOP"
1pc	1-543-316-21	s HEAD, SENSING(SMALL TYPE)"TAPE END"
1pc	1-690-117-11	s WIRE, FLEXIBLE CARD 25P (MB-362 board to MB-363 board)
1pc	1-690-118-11	s WIRE, FLEXIBLE CARD 15P (MB-362 board to CM-504 board)
1pc	1-690-119-11	s WIRE, FLEXIBLE CARD 16P (MB-363 board to VO-34 board)
1pc	1-690-120-11	s WIRE, FLEXIBLE CARD 20P (MB-362 board to CM-504 board)
1pc	1-690-121-11	s WIRE, FLEXIBLE CARD 26P (VO-34 board to MB-363 board)
1pc	1-806-682-81	s SENSOR, DEW CONDENSATION
CN1	1-560-999-41	s CONNECTOR, XLR 4P, MALE "EXT DC IN"
CN001F (to AU-144P board)		1-569-197-11 o HOUSING 4P 1-569-193-11 o CONTACT, FEMALE
CN001F (to CN-505 board)		1-562-256-00 o HOUSING 6P 1-562-260-11 o CONTACT, IL-S, FEMALE AWG24-28
CN001F (to KY-211 board)		1-565-129-11 o HOUSING 10P 1-565-164-11 o CONTACT, FEMALE AWG28-26
CN002F (to EXT DC IN)		1-565-169-11 o HOUSING 7P 1-562-260-11 o CONTACT, IL-S, FEMALE AWG24-28
CN002F (to AU-144P board)		1-569-197-11 o HOUSING 4P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN002F (to SS-46P board)		1-569-206-11 o HOUSING 13P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN002F (to TC-60P board)		1-569-206-11 o HOUSING 13P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN003F (to AU-144P board)		1-569-198-11 o HOUSING 5P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN003F (to CN-560 board)		1-562-256-00 o HOUSING 6P 1-562-260-11 o CONTACT, IL-S, FEMALE AWG24-28
CN003F (to MB-363 board)		1-569-201-11 o HOUSING 8P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN003F (to VO-34P board)		1-569-196-11 o HOUSING 3P 1-569-191-11 o CONTACT, FEMALE, AWG22-26 1-569-193-11 o CONTACT, FEMALE AWG24-30

(FRAME)

Ref. No. or Q'ty	Part No.	SP Description
CN004F (to AU-144P board)		1-569-197-11 o HOUSING 4P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN004F (to MB-362 board)		1-569-198-11 o HOUSING 5P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN004F (to SS-46P board)		1-569-195-11 s HOUSING 2P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN004F (to VO-34P board)		1-569-196-11 o HOUSING 3P 1-569-191-11 o CONTACT, FEMALE AWG22-26 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN005F (to AU-144P board)		1-569-196-11 o HOUSING 3P 1-569-191-11 o CONTACT, FEMALE AWG22-26 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN005F (to MB-363 board)		1-562-255-00 o HOUSING 5P 1-562-260-11 o IL-S, FEMALE AWG24-28
CN005F (to VO-34P board)		1-569-196-11 o HOUSING 3P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN006F (to AU-144P board)		1-569-199-11 o HOUSING 6P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN006F (to MB-363 board)		1-569-196-11 o HOUSING 3P 1-569-191-11 o CONTACT, FEMALE AWG22-26
CN006F (to SS-46P board)		1-565-129-11 o HOUSING 10P 1-565-164-11 o CONTACT, FEMALE AWG28-26
CN006F (to VO-34P board)		1-569-196-11 o HOUSING 3P 1-569-191-11 o CONTACT, FEMALE AWG22-26 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN007F (to MB-363 board)		1-580-696-11 o HOUSING 9P 1-562-260-11 o IL-S, FEMALE AWG24-28
CN007F (to SS-46P board)		1-569-195-11 o HOUSING 2P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN007F (to VO-34P board)		1-569-196-11 o HOUSING 3P 1-569-191-11 o CONTACT, FEMALE AWG22-26 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN012F (to MB-363 board)		1-569-199-11 o HOUSING 6P 1-569-193-11 o CONTACT, FEMALE AWG24-30
CN101F (to TC-60P board)		1-569-196-11 o HOUSING 3P 1-569-191-11 o CONTACT, FEMALE, AWG22-26 1-569-193-11 o CONTACT, FEMALE

(FRAME)

Ref. No. or Q'ty	Part No.	SP Description
CN102F (to TC-60P board)		
	1-569-196-11 o	HOUSING 3P
	1-569-191-11 o	CONTACT, FEMALE, AWG22-26
	1-569-193-11 o	CONTACT, FEMALE
CN104F (to TC-60P board)		
	1-569-196-11 o	HOUSING 3P
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN105F (to TC-60P board)		
	1-569-196-11 o	HOUSING 3P
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN106F (to TC-60P board)		
	1-569-195-11 s	HOUSING 2P
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN107F (to TC-60P board)		
	1-569-195-11 s	HOUSING 2P
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN108F (to MB-362 board)		
	1-569-197-11 o	HOUSING 4P
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN109F (to MB-362 board)		
	1-569-199-11 o	HOUSING 6P
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN201F (to LD-39 board)		
	1-580-587-11 o	HOUSING 22P
	1-580-599-11 o	CONTACT, FEMALE AWG26-30
CN201F (to SS-46P board)		
	1-569-197-11 o	HOUSING 4P
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN202F (to LD-39 board)		
	1-569-197-11 o	HOUSING 4P
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN202F (to SS-46P board)		
	1-569-195-11 s	HOUSING 2P
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN203F (to SS-46P board)		
	1-569-202-11 o	HOUSING 9P
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN204F (to SS-46P board)		
	1-569-196-11 o	HOUSING 3P
	1-569-191-11 o	CONTACT, FEMALE AWG22-26
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN301F (to CAPSTAN MOTOR)		
	1-569-202-11 o	HOUSING 9P
	1-569-193-11 o	CONTACT, FEMALE AWG24-30
CN501F (to AH-36 board)		
	1-573-745-11 o	HOUSING 2P
	1-568-030-21 o	CONTACT, FEMALE
CN502F (to AH-36 board)		
	1-573-745-11 o	HOUSING 2P
	1-568-030-21 o	CONTACT, FEMALE
CN503F (to AH-36 board)		
	1-573-745-11 o	HOUSING 2P
	1-568-030-21 o	CONTACT, FEMALE

(FRAME)

Ref. No. or Q'ty	Part No.	SP Description
CN9006	1-573-618-11 s	CONNECTOR, XLR 3P, FEMALE "CH-1/CH-2 AUDIO IN"
CN9202	1-562-382-31 s	CONNECTOR, BNC, FEMALE "EXT TIME CODE IN"
CN9203	1-562-382-31 s	CONNECTOR, BNC, FEMALE "EXT TIME CODE OUT"
CN9204	1-562-382-31 s	CONNECTOR, BNC, FEMALE "GEN LOCK VIDEO IN"
CN9205	1-562-382-31 s	CONNECTOR, BNC, FEMALE "VIDEO OUT"
FB	1-543-157-00 s	BEAD, FERRITE
H1	A-6762-455-A s	UPPER DRUM ASSY, DBR-23-R
H2	8-825-554-83 s	HEAD, CTL PS244-21B "CTL"
H3	8-825-770-72 s	HEAD, FE EF291-21 "FULL ERASE"
H4	8-825-776-11 s	HEAD, AU PS244-2103D "AU CH-1/CH-2 R/P, TC"
M1	A-6737-208-A s	MOTOR ASSY "DRUM"
M2	8-835-437-01 s	MOTOR, DC SCV-0201A "CAPSTAN"
M3	8-835-461-01 s	MOTOR, DC LN22-M16Z1B "REEL"
M4	8-835-462-01 s	MOTOR, DC DN20-Q7Z2B "THREAD"
ME1	1-520-495-11 s	METER, LEVEL "CH-1"
ME2	1-520-495-21 s	METER, LEVEL "CH-2"
PM1	1-454-445-21 s	SOLENOID "PINCH"
PM2	1-454-382-31 s	SOLENOID "BRAKE"
RV1	1-237-790-11 s	RES, VAR CARBON 10K "CH-1 REC LEVEL"
RV2	1-237-790-11 s	RES, VAR CARBON 10K "CH-2 REC LEVEL"
RV3	1-237-790-21 s	RES, VAR CARBON 10K "MONITOR LEVEL"
RV4	1-237-790-21 s	RES, VAR CARBON 10K "ALARM LEVEL"
SP1	1-503-293-00 o	SPEAKER
S1	1-553-448-00 s	SWITCH, TOGGLE

# PACKING MATERIALS & SUPPLIED ACCESSORIES

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-6772-374-A	s BELT ASSY, SHOULDER
1pc	3-172-687-01	o INDIVIDUAL CARTON
1pc	3-172-010-01	o CUSHION (UPPER)
1pc	3-172-011-01	o CUSHION (LOWER)
4pcs	3-717-823-01	s COVER, BMC
1pc	3-718-084-01	o BOX, ACCESSORY
1pc	3-753-945-01	s MANUAL, INSTRUCTION (JAPANESE)
1pc	3-753-945-11	s MANUAL, INSTRUCTION (ENGLISH)
1pc	3-753-945-41	s MANUAL, INSTRUCTION (FRENCH)
1pc	3-753-945-51	s MANUAL, INSTRUCTION (GERMAN)
1pc	3-753-945-61	s MANUAL, INSTRUCTION (ITALIAN)
2pc	7-682-560-09	s SCREW +B 4X6
2pc	7-682-563-09	s SCREW +B 4X12

# OPTIONAL FIXTURE

Part No.	SP Description
J-6001-820-A	o DRUM ECCENTRICITY GAUGE (3)
J-6001-830-A	o DRUM ECCENTRICITY GAUGE (2)
J-6001-840-A	o DRUM ECCENTRICITY GAUGE (1)
or	
J-6325-530-A	o DRUM ECCENTRICITY GAUGE (6)
J-6087-000-A	o DRUM ECCENTRICITY GAUGE (5)
J-6080-003-C	o T TYPE TORQUE MEASUREMENT CASSETTE
J-6080-008-A	o CASSETTE REFERENCE PLATE
J-6080-011-A	o REEL TABLE TENSION GAUGE
J-6080-029-A	o SMALL MIRROR FOR ADJUSTMENT
J-6086-570-A	o PARALLEL BOARD
J-6152-450-A	o WIRE CLEARANCE CHECK GAUGE
J-6190-800-A	o TENSION REGULATOR SCANTNESS CHECK TOOL
J-6321-040-A	o DRIVER
J-6321-500-A	o TAPE GUIDE ADJUSTMENT DRIVER
J-6332-290-A	o SERVO REMOTE CONTROL TOOL (EW-229)
J-6335-790-A	o DEVIATION CHECKER (EW-579)
J-6337-830-A	o CAMERA TOOL
J-6330-040-A	o CABLE (EW-804)
2-034-697-00	o CLEANING PIECE
7-661-018-18	o OIL
7-662-010-04	o GREASE (SGL-505)
7-700-736-05	o HEXAGONAL WRENCH (across / at has 1.5mm)
7-700-736-06	o HEXAGONAL WRENCH (across / at has 0.89mm)
7-732-050-30	o TENSION SCALE (100G)
7-732-050-40	o TENSION SCALE (200G)
8-960-096-51	o ALIGNMENT TAPE, CR2-1BPS
8-960-096-86	o ALIGNMENT TAPE, CR8-1BPS
8-960-096-91	o ALIGNMENT TAPE, CR5-1BPS
8-960-098-44	o ALIGNMENT TAPE, CR5-2APS
8-960-098-45	o ALIGNMENT TAPE, CR8-1APS
9-919-573-01	o CLEANING FLUID
Standard products	TENTELOMETER (U2-W7-UMC)

## SECTION 14 CHANGED PART

NOTE: The numbers identified by making with ) are matching with each serial numbers.

106) Serial No. 10101 through 10500  
107) Serial No. 10501 through 10800  
108) Serial No. 10801 and higher

### AU-144P BOARD

OLD) C23 1-162-915-11 s CERAMIC, CHIP 10PF 5PF 50V  
107) C23 DELETED.  
OLD) C55 1-162-967-11 s CERAMIC, CHIP 0.0033uF 10%  
107) C55 1-162-970-11 s CERAMIC, CHIP 0.01uF 5% 25V  
OLD) R50 1-216-843-11 s METAL, CHIP 68K 5% 1/16W  
107) R50 1-216-839-11 s METAL, CHIP 33K 5% 1/16W

OLD) R51 1-216-843-11 s METAL, CHIP 68K 5% 1/16W  
107) R51 1-216-839-11 s METAL, CHIP 33K 5% 1/16W  
OLD) R63 1-216-864-11 s METAL, CHIP 0 5% 1/16W  
108) R63 1-216-295-00 s METAL, CHIP 0-OHM  
OLD) R64 1-216-864-11 s METAL, CHIP 0 5% 1/16W  
108) R64 1-216-295-00 s METAL, CHIP 0-OHM

### DUS-496 BOARD

OLD) 1pc 1-642-156-11 o PRINTED CIRCUIT BOARD, DUS-496  
107) 1pc DELETED.  
OLD) Q1 8-729-905-61 s TRANSISTOR DTC124EU  
107) Q1 DELETED.  
OLD) Q2 8-729-905-61 s TRANSISTOR DTC124EU  
107) Q2 DELETED.

OLD) R1 1-216-295-00 s RES, CHIP 0 5% 1/10W  
107) R1 DELETED.  
OLD) R2 1-216-699-11 s 100K 0.5% 1/10W  
107) R2 DELETED.  
OLD) R3 1-249-421-11 s 2.2K 5% 1/4W  
107) R3 DELETED.

OLD) R4 1-249-421-11 s 2.2K 5% 1/4W  
107) R4 DELETED.

### DUS-852 BOARD

OLD) 1pc 1-641-735-11 o PRINTED CIRCUIT BOARD, DUS-852  
107) 1pc DELETED.  
OLD) C601 1-135-091-91 s ELECT, CHIP 1uF 20% 16V  
107) C601 DELETED.  
OLD) IC601 8-759-245-06 s IC TC4S584F  
107) IC601 DELETED.

OLD) IC602 8-759-209-58 s IC TC4S69F  
107) IC602 DELETED.  
OLD) R602 1-216-109-00 s METAL, CHIP 330K 5% 1/10W  
107) R602 DELETED.  
OLD) R604 1-216-073-00 s 10K 50% 1/10W  
107) R604 DELETED.

### SS-46P BOARD

OLD) C244 1-126-630-11 s ELECT 82uF 20% 25V  
107) C244 1-124-478-11 s ELECT 100uF 20% 25V  
OLD) C245 1-124-489-11 s ELECT 150uF 20% 25V  
107) C245 1-124-600-11 s ELECT 270uF 20% 22V  
OLD) C416 1-126-630-11 s ELECT 82uF 20% 25V  
107) C416 1-124-478-11 s ELECT 100uF 20% 25V

OLD) C601 NOT IN USE.  
107) C601 1-135-091-00 s TANTALUM, CHIP 1uF 10% 16V  
OLD) IC601 NOT IN USE.  
107) IC601 8-759-245-41 s IC TC4S584F  
OLD) IC602 NOT IN USE.  
107) IC602 8-759-209-57 s IC TC4S69F

OLD) Q511 NOT IN USE.  
107) Q511 8-729-905-61 s TRANSISTOR DTC124EU  
OLD) Q512 NOT IN USE.  
107) Q512 8-729-905-61 s TRANSISTOR DTC124EU  
OLD) R274 1-216-855-11 s METAL, CHIP 680K 5% 1/16W  
107) R274 1-216-848-11 s METAL, CHIP 180K 5% 1/16W  
107) R274 1-216-845-11 s METAL, CHIP 100K 5% 1/16W

OLD) R276 1-216-849-11 s METAL, CHIP 220K 5% 1/16W  
107) R276 1-216-851-11 s METAL, CHIP 330K 5% 1/16W  
OLD) R284 1-216-849-11 s METAL 220K 5% 1/16W  
107) R284 1-216-748-11 s METAL 220K 0.5% 1/16W  
OLD) R323 1-216-837-11 s METAL, CHIP 22K 5% 1/16W  
107) R323 1-216-841-11 s METAL, CHIP 47K 5% 1/16W

OLD) R324 1-216-837-11 s METAL, CHIP 22K 5% 1/16W  
107) R324 1-216-841-11 s METAL, CHIP 47K 5% 1/16W  
OLD) R325 1-216-837-11 s METAL, CHIP 22K 5% 1/16W  
107) R325 1-216-841-11 s METAL, CHIP 47K 5% 1/16W  
OLD) R326 1-216-837-11 s METAL, CHIP 22K 5% 1/16W  
107) R326 1-216-841-11 s METAL, CHIP 47K 5% 1/16W

OLD) R327 1-216-821-11 s METAL, CHIP 1K 5% 1/16W  
107) R327 1-216-841-11 s METAL, CHIP 1K 5% 1/16W  
OLD) R349 NOT IN USE.  
107) R349 1-216-864-11 s METAL, CHIP 0 5% 1/16W  
OLD) R350 NOT IN USE.  
107) R350 1-216-821-11 s METAL, CHIP 1K 5% 1/16W

OLD) R604 NOT IN USE.  
107) R604 1-216-833-11 s METAL, CHIP 10K 5% 1/16W  
OLD) R605 NOT IN USE.  
107) R605 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W  
OLD) R606 NOT IN USE.  
107) R606 1-216-825-11 s METAL, CHIP 2.2K 5% 1/16W

OLD) RV201 1-237-036-11 s RES, ADJ, METAL 10K  
107) RV201 1-237-035-11 s RES, ADJ, METAL 5K  
OLD) RV202 1-237-036-11 s RES, ADJ, METAL 10K  
107) RV202 1-237-035-11 s RES, ADJ, METAL 5K

#### TC-60P BOARD

OLD)	C9	1-126-154-11 s ELECT 470F 20% 6.3V
106)	C9	1-135-166-21 s TANTALUM, CHIP 470F 10% 10V
OLD)	R155	1-216-795-00 s METAL, CHIP 0 5X 1/10W
106)	R155	DELETED.
OLD)	R255	1-216-795-00 s METAL, CHIP 0 5X 1/10W
106)	R255	DELETED.
OLD)	R587	1-216-849-11 s METAL, CHIP 220K 5% 1/16W
106)	R587	1-216-851-11 s METAL, CHIP 330K 0.5% 1/16W
OLD)	R619	1-216-833-11 s METAL, CHIP 10K 5% 1/16W
106)	R619	1-216-821-11 s METAL, CHIP 1K 0.5% 1/16W
OLD)	R632	1-216-849-11 s METAL, CHIP 220K 5% 1/16W
106)	R632	DELETED.
OLD)	R651	NOT IN USE.
108)	R651	1-218-738-11 s METAL, CHIP 82K 0.5% 1/16W
OLD)	R702	NOT IN USE.
106)	R702	1-216-864-11 s METAL, CHIP 0 5X 1/16W

#### VO-34P BOARD

OLD)	R233	1-216-603-11 s METAL, CHIP 10 5X 1/10W
107)	R233	1-216-613-11 s METAL, CHIP 27 0.5% 1/10W
OLD)	R235	1-216-603-11 s METAL, CHIP 10 5X 1/10W
107)	R235	1-216-613-11 s METAL, CHIP 27 0.5% 1/10W
OLD)	R400	1-216-833-11 s METAL, CHIP 10K 5% 1/16W
106)	R400	DELETED.
OLD)	R407	1-216-821-11 s METAL, CHIP 1K 5% 1/16W
106)	R407	1-218-708-11 s METAL, CHIP 4.7K 0.5% 1/16W
OLD)	R644	1-216-603-11 s METAL, CHIP 10 5X 1/10W
107)	R644	1-216-613-11 s METAL, CHIP 27 0.5% 1/10W
OLD)	R646	1-216-603-11 s METAL, CHIP 10 5X 1/10W
107)	R646	1-216-613-11 s METAL, CHIP 27 0.5% 1/10W